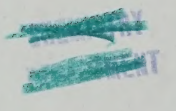
THE UNIVERSITY

OF ILLINOIS

LIBRARY

612.05
PH
v.6
cop. 2.



Digitized by the Internet Archive
in 2026 with funding from
University of Illinois Urbana-Champaign Alternates

https://archive.org/details/physiologicalabs6192unse

UNIVERSITY OF ILLINOIS
LIBRARY-CHEMISTRY

PHYSIOLOGICAL ABSTRACTS

VOL. VI.

1921—1922

PHYSIOLOGICAL ABSTRACTS

UNIVERSITY OF ILLINOIS
LIBRARY-CHEMISTRY

ISSUED BY

THE PHYSIOLOGICAL SOCIETY

(GREAT BRITAIN AND IRELAND)

WITH THE CO-OPERATION OF

THE AMERICAN PHYSIOLOGICAL SOCIETY

AND ALSO OF

THE AMERICAN CHEMICAL SOCIETY
THE AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY
THE AMERICAN PHARMACOLOGICAL SOCIETY
THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS
BIOLOGISK SELSKAB OF COPENHAGEN
THE CARNEGIE INSTITUTION OF WASHINGTON
THE CHEMICAL SOCIETY (GREAT BRITAIN AND IRELAND)
THE BIOCHEMICAL SOCIETY (GREAT BRITAIN AND IRELAND)
ARCHIVES INTERNATIONALES DE PHYSIOLOGIE (PROF. LÉON FREDERICQ)
SOCIÉTÉ BELGE DE BIOLOGIE (PROF. E. ZUNZ)
THE RUSSIAN BIOLOGICAL SOCIETY
ARCHIVIO DI FISIOLOGIA (PROF. FANO)
ARCHIVES ITALIENNES DE BIOLOGIE (PROF. ADUCCO)
ARCHIVES NÉERLANDAISES DE PHYSIOLOGIE (J. P. LOTSY)
JOURNAL DE PHYSIOLOGIE (PROFS. E. GLEY AND CH. RICHET)
ACTA SCHOLÆ MEDICINALIS, KYOTO

PROF. ARTHUS (SWITZERLAND) — PROF. A. KROGH (DENMARK)
PROF. BABKIN (RUSSIA) — PROF. OVERTON (SWEDEN)
PROF. H. J. HAMBURGER (HOLLAND) — PROF. ZWAARDEMAKER (HOLLAND)
PROF. ISHIKAWA (JAPAN)

EDITED BY W. D. HALLIBURTON
Professor of Physiology, King's College, London

ASSISTANT EDITOR, C. LOVATT EVANS
ASSISTANT EDITOR (FOR PLANT PHYSIOLOGY), WALTER STILES

VOL. VI.

LITERATURE FOR 1921

LONDON
H. K. LEWIS & CO. LTD.

14 Nov. 22 B.N.B.
612.05
PH
v.6
cop.2
Chem.
UNIVERSITY OF ILLINOIS
LIBRARY-CHEMISTRY

EDITOR'S NOTE TO VOL. VI.

The Physiological Society has again to express its gratitude to the Royal Society, the American Physiological Society, and the Society of American Biological Chemists, for a renewal of their generous grants which have enabled our work to proceed.

In face of the present financial situation it has been necessary to practise certain economies in production, and here the proprietors would mention with grateful thanks the handsome way in which the publishers have been able to meet them.

The work of the journal continues to grow, as seen by its increased size, and this has more than justified the appointment of an Assistant Editor, as mentioned last year. I must, however, announce with regret that Dr. Lovatt Evans, owing to pressure of other duties, has been obliged to relinquish this post. He will be succeeded by Dr. J. A. Hewitt, who has many aptitudes for this work. I cannot omit to mention the services of our indexer Miss Anne Newbold; we owe her a great deal, not only for her industry and promptness, but also for her detection of errata in this and previous volumes.

W. D. HALLIBURTON.

King's College, London,
February, 1922.

The Proprietors regret that, in spite of the economies referred to above, they are again obliged to raise the price of "Physiological Abstracts." The subscription for Vol. VII., commencing with the April issue, will be 42s. Those subscribers who pay by Bankers' Orders are requested to write to their Bankers and ask them to alter the amount accordingly.

506125

CONTRIBUTORS TO VOL. VI.

Professor M. O. Almeida.
Dr. G. V. Anrep.
Professor F. A. Bainbridge.
Professor W. M. Bayliss.
*Dr. F. F. Blackman.
*Professor V. H. Blackman.
*Dr. Boysen-Jensen.
Dr. J. H. Burn.
*Mr. G. E. Briggs.
Dr. R. Brinkman.
*Dr. W. Brown.
Professor G. A. Buckmaster.
Dr. Argyll Campbell.
Professor A. R. Cushny.
Dr. H. H. Dale.
Professor A. Dendy.
Dr. Drummond.
Dr. H. W. Dudley.
Dr. C. Lovatt Evans.
Dr. C. da Fano.
Professor Léon Fredericq.
Dr. I. Frost.
Dr. R. R. Gates.
Dr. Ejerton C. Grey.
Professor J. A. Gunn.
Dr. W. E. Gye.
Professor W. D. Halliburton.
Dr. D. T. Harris.
Dr. J. A. Hewitt.
Professor B. A. Houssay.
Dr. Harold King.
*Dr. R. C. Knight.
Dr. R. K. S. Lim.
Professor E. Mellanby.
Professor J. A. Menzies.
Mr. T. R. Parsons.
Mrs. W. Parsons.
Dr. E. Ponder.
*Professor J. S. Priestley.
Professor H. E. Roaf.
Sir Charles Sherrington.
Dr. D. H. de Souza.
*Professor W. Stiles.
Mr. W. L. Symes.
Professor Swale Vincent.
Dr. Hilda Walker.
Dr. May L. Walker.
Professor A. D. Waller.
Dr. H. Wastl.
Mr. T. A. Webster.
*Dr. Cyril West.
Professor E. Zunz.

*** Plant Physiology.**

CONTENTS TO VOL. VI.

PAGES

General 1, 107, 169, 235, 293, 349, 401, 469, 547, 609

Apparatus and Methods 3, 108, 170, 236, 294, 349, 402, 470, 548, 609

Chemical 7, 110, 172, 237, 294, 350, 404, 472, 549, 611

Enzymes 352, 407, 477, 551, 613

Also under Chemical: Alimentary Canal

Physiology of Invertebrates 14, 113, 176, 241, 297, 353, 410, 479, 551, 614

Cells and Tissues 18, 116, 177, 243, 300, 354, 412, 480, 553, 616

Muscle 21, 118, 179, 245, 302, 357, 414, 483, 556, 618

Nerve, Reflex Action 23, 121, 181, 247, 304, 359, 416, 488, 559, 619

Central Nervous System 24, 122, 182, 249, 304, 360, 416, 490, 560, 620

Special Senses 26, 124, 184, 250, 305, 362, 419, 492, 561, 620

Psychology 30, 126, 185, 251, 364, 421, 492, 563, 622

Cerebro-Spinal Fluid 31, 127, 185, 252, 308, 365, 420, 493, 564, 623

Blood 32, 128, 186, 252, 308, 366, 422, 493, 564, 624

Heart 40, 131, 191, 255, 312, 369, 426, 498, 568, 627

Circulation 44, 132, 193, 258, 314, 370, 429, 500, 570, 629

Respiration 45, 135, 193, 259, 315, 371, 430, 502, 572, 630

Alimentary Canal 52, 136, 197, 260, 316, 372, 432, 503, 573, 631

Foods and Diet 56, 138, 199, 262, 318, 374, 435, 507, 632

Vitamins 58, 139, 201, 263, 319, 374, 435, 507, 576, 633

Metabolism 64, 141, 203, 266, 320, 376, 437, 511, 578, 635

Temperature, Animal Heat 68, 142, 205, 321, 378, 440

Sugar and Diabetes 49, 142, 206, 268, 322, 378, 440, 514, 580, 636

Urinary System 62, 143, 207, 270, 323, 380, 444, 516, 580, 637

Urine 62, 144, 209, 270, 323, 380, 444, 516, 580

Endocrine System 69, 146, 211, 271, 325, 382, 445, 519, 581, 638

Skin 210, 324

Reproductive System 75, 149, 213, 275, 328, 384, 448, 522, 585, 640

Milk 61, 150, 216, 277, 386, 523, 588, 642

Pharmacology 79, 151, 217, 278, 329, 386, 451, 523, 588, 642

Toxicology 84, 219, 280, 333, 390, 451, 526, 593, 642

Pathology 87, 155, 221, 282, 334, 391, 455, 528, 597

Plant Physiology 93, 158, 222, 284, 336, 393, 457, 530, 599, 644

Book Reviews 104, 168, 233, 292, 346, 399, 465, 544, 607, 650

Obituary Notices 347, 400, 468, 546

ERRATA

IN VOL. I.

Abstracts Nos. 712, 712*a*, pp. 208–209, *for* "Costatino" *read* "Costantino."

IN VOL. II.

Abstract No. 1110, p. 272, *for* "Quinquand" *read* "Quinquaud."

IN VOL. III.

Abstract No. 508, p. 104, *for* "Pflüger's Arch., 196," *read* "Pflüger's Arch., 169."
Abstract No. 531, p. 109, *for* "Pflüger's Arch., 196," *read* "Pflüger's Arch., 169."
Abstract No. 1729, p. 312, *for* "Constantino," *read* "Costantino."
Abstract No. 2175, p. 385, *for* "Quinquand," *read* "Quinquaud."
Abstract No. 2867, p. 499, *for* "Constantino" *read* "Costantino."
Abstract No. 2954, p. 510, *for* "Quinquand," *read* "Quinquaud."

IN VOL. IV.

Abstract No. 193, p. 35, *for* "Quinquand" *read* "Quinquaud."

IN VOL. V.

Abstract No. 1826, p. 288, author's name, *for* "Koolman" *read* "Koopman."
Abstract No. 3013, p. 479, *for* "Quinquand," *read* "Quinquaud."

IN VOL. VI.

Abstract No. 82, p. 11, *for* "Berkley" *read* "Berkeley."
Abstract No. 137, p. 19. *Author's name is* "Dragoiu," *not* "Dragoin."
Abstract No. 305, p. 47, *for* "J. J. Peters" *read* "J. P. Peters."
Abstract No. 375, p. 57, *for* "Ellet" *read* "Ellett."
Abstracts Nos. 571 and 587, pp. 88 and 90, *for* "Forrsman" *read* "Forssman."
Abstract No. 579, p. 89, *for* "Basedow's and Kropf's Diseases" *read* "Basedow's Disease and Goitre."
Abstracts Nos. 589 and 590, pp. 90–91. *Author's name is* "Renaux."
Abstract No. 921, p. 140, *for* "Lamer" *read* "La Mer."
Abstract No. 932, p. 141, *for* "Adolf" *read* "Adolph."
Abstract No. 1010, p. 153, *for* "Menegletti" *read* "Meneghetti."
Abstract No. 1048, p. 158, *for* "Pastchovsky" *read* "Patschowsky."
Abstract No. 1052, p. 158. *Author's name should be* "Kolkwitz."
Abstract No. 1262, Vol. VI., p. 187. *Author's name for* "Falte" *read* "Falta."
Abstract No. 1363, p. 202. *Author's Initials are* "R. J." *not* "J. R."
Abstract No. 1506, p. 220, *for* "G. W. Raizin" *read* "G. W. Raiziss."
Abstract No. 1594, p. 230, *for* "H. G. Maughan" *read* "H. J. Maugham."
Abstract No. 1626, p. 236. *Author's initials should be* "M. N. J."
Abstracts Nos. 1694, 1695, p. 245; 1778, p. 258. *Author's name is* "Reijs."
Abstract No. 1745, p. 254. *See note on* p. 348.
Abstract No. 1791, Vol. VI., p. 260. *Author's name for* "R. Richaud" *read* "A. Richaud."
Abstract No. 2002, p. 288, *for* "H. J. Maughan" *read* "H. J. Maugham."
Abstract No. 2008, p. 289, *for* "E. V. Nelson" *read* "V. E. Nelson."
Abstract No. 2080, p. 300, for "Betances" *read* "Bétancès."
Abstract No. 2195, p. 318, *for* "Meyers" *read* "Myers."
Abstract No. 2232, p. 324, *for* "Magarth" *read* "Magath."
Abstract No. 2266, p. 329, *for* "Lipschutz" *read* "Lipschütz."
Abstract No. 2277, p. 330, *for* "Reiman" *read* "Reimann."
Abstract No. 2286, p. 332, *for* "Schenck" *read* "Schenk."
Abstract No. 2334, p. 338, *for* "F. Hemmi," *read* "T. Hemmi."
Abstract No. 2541, p. 367, *for* "Nolf, R." *read* "Nolf, P."
Abstract No. 2551, p. 368. *Author's name is* "Wilbrand."
Abstract No. 2607, p. 377, *for* "Tannhauser" *read* "Thannhauser."
Abstract No. 2697, p. 388. *Author's name is* "Myttenaere."
Abstract No. 2743, p. 394, *for* "Kahno," *read* "Kahho."
P. 399. First review. *Author's name is* "Lumière."
Abstract No. 2826, p. 409, *for* "Frankel" *read* "Fränkel."
Abstract No. 2919, p. 425, *for* "F. T. Tisdall" *read* "F. F. Tisdall."
Abstract No. 2942, p. 429, *for* "Quinquand" *read* "Quinquaud."
Abstract No. 3035, p. 443, *for* "Schaffer" *read* "Shaffer."
Abstract No. 3146, *for* "Lapique," *read* "Lapicque."
Abstract No. 3468, p. 510, *for* "L. G. Unger," *read* "L. J. Unger."
Abstract No. 3536, p. 520, *for* "Quinquand" *read* "Quinquaud."
Abstract No. 3612, p. 531, *for* "A. J. Anderson" *read* "R. J. Anderson."
Abstract No. 3643, p. 535, *for* "Batelli" *read* "Battelli."
Abstract No. 3645, p. 536, *for* "Constantino" *read* "Costantino."
Abstract No. 3738, p. 551, *for* "Furska" *read* "Finska."
Abstract No. 4109, p. 610, *for* "J. S. Thannhauser" *read* "S. J. Thannhauser."

PHYSIOLOGICAL ABSTRACTS

GENERAL

1. Presidential Addresses at British Association Meeting, Cardiff, 1920. Zoology. J. S. Gardiner. **Anthropology.** K. Pearson. **Physiology.** J. Barcroft (*Brit. Assoc. Rep. of 88th Meeting*, 1920, 87-97, 135-51, 152-68).—These three addresses will amply repay careful perusal by all interested in biological science. Prof. Stanley Gardiner's *motif* is that Zoology, to be a live science, must abandon giving a pre-eminent place to mere structure and classification, but should attach supreme importance to its physiological aspect. The character of Prof. Karl Pearson's address may be gathered if I quote one or two sentences from its opening and its close. "I am a scientific heretic; I do not believe in science for its own sake. I believe only in science for man's sake." "The organisation of existing human society with a view to its future welfare is the crowning task of the science of man." "Thought and learning are of little value if they be not translated into action." Mr. Barcroft's address has already been noticed in these pages (see Abstract No. 1886, Vol. V., p. 299). All will welcome its publication in full.—W. D. H.

2. Compte rendu du Congrès de Physiologie de Paris (16 au 20 juillet, 1920). Léon Fredericq (*Arch. intern. physiol.*, 1920, **15,** 361-377).—L. F.

3. Some Influences of French Science on Medicine. Graham Lusk (*J. Amer. Med. Assoc.*, 1921, **76,** 1-8).—The Pasteur Lecture, dealing especially with the experiments of Lavoisier, and giving many interesting references and quotations.—C. L. E.

4. Troisième réunion annuelle de physiologistes Amsterdam, December, 1917 (*Arch. néerl. de physiol.*, 1920, **5,** 89-155).—A belated brief account of the proceedings under the presidency of Prof. Zwaardemaker).—W. D. H.

5. Physiology: The Institutes of Medicine. D. N. Paton (*Glasgow Med. J.*, December, 1920; reprint pp. 9).—A useful and wise introductory address to students. Its title indicates its scope.—W. D. H.

6. Fatigue and Efficiency in the Iron and Steel Industry. H. M. Vernon (*Rep. of Indust. Fatigue Board*, 1920, **5,** pp. 99, price 3s; H.M. Stationery Office).—This report deals with the special case of the industry with full detail, but the main physiological result coincides with that noticeable in other trades. (Compare Abstract No. 3213, Vol. V., p. 514.)—W. D. H.

7. Comparison of an Eight-Hour Plant and a Ten-Hour Plant. Report by Josephine Goldmark and Mary D. Hopkins on work by P. S. Florence and associates (*Publ. Health Bull.*, 1920, No. 106, Treas. Dept. U.S. Publ. Health Service, pp. 213).—Full report and commentary on a study in industrial fatigue, already noted in these pages (Abstract No. 1864, Vol. IV., p. 301).—W. D. H.

8. Control of Air Dustiness. O. M. Spencer (*Publ. Health Rep.*, U.S. Treas. Dept., 1920, **35,** 2907-14).—A full account of the matter previously noted in these abstracts (No. 2925, Vol. V., p. 467). In this investigation an important point noted was that wet-grinding is almost as dangerous as dry-grinding processes.—W. D. H.

9. Physiological Effects of High Temperatures and High Humidities in Metal Mines. R. R. Sayers and D. Herrington (*Publ. Health Rep.*, U.S.A., 1921, **36,** 116-29).—Systolic and diastolic blood-pressures fall, body temperature rises. Tachycardia, perspiration,

dizziness, physical weakness, mental confusion, nausea, and headache are also found. —J. A. H.

10. Considerations concerning the Nature and Origin of Physiological Gradients. C. M. Child (*Biol. Bull.*, 1920, **39,** 147-87).—The organism represents a pattern of some kind which is of a higher order of magnitude than protoplasmic pattern. Protoplasm *per se* lacks any mechanism for originating such patterns. In general features such as polarity and symmetry this pattern seems largely to be independent of specific differences in protoplasmic constitution; thus it may represent primarily a non-specific or quantitative condition or relation in a specific protoplasm. The simplest form of axiate pattern is primarily a gradient in physiological condition involving fundamental metabolic reactions and other factors. Such gradients arise in the final analysis from differential exposure to external factors which affect the rate of protoplasmic activity. The primary physiological relations thus established are excitation and transmission; from the first moment of differentiation chemical or transportative correlation is possible, and is important in the process of development.—J. A. H.

11. The Metabolic Gradients of Vertebrate Embryos. I. Teleost Embryos. Libbie H. Hyman (*Biol. Bull.*, 1921, **40,** No. 1).—The death gradients in toxic solutions were studied in the embryonic stages of cod, etc. The most susceptible parts of the embryos are the forebrain and head, eyes, heart, and posterior end. A death gradient is present in the heart, the venous end dying first, and death then proceeding towards the arterial end. The relation of the results to normal and teratological development is discussed. It is pointed out that the trunk and tail of teleosts are formed by a growing region situated in the germ ring—a method of development similar to that of annelids. The anterior end of the embryo is formed independently of the germ ring. The evidence does not support the theory of concrescence. An explanation of teleost terata based on the gradients is given. They are due to differential inhibition, in which case the most susceptible parts enumerated above fail to develop or develop abnormally; or to differential recovery, in which case these parts recover while other parts fail to do so. The oxygen consumption and CO_2 production of the Fundulus embryo is greatest at the time when the germ ring is near the equator, at which time also the eggs are highly susceptible to external agents.—W. D. H. (*W. I.*).

12. Nature of Vowel Sounds. E. W. Scripture (*Nature*, 1921, **106,** 632-4, 664-6).—By analysis of gramophone records it is found that the fundamental is not a sine vibration, but a series of more or less sharp puffs, as asserted by Willis in 1830 and Hermann in 1889. By the use of a puff-siren and a soft-walled resonator, vowel sounds can be synthesised. In a vowel there are two groups of elements: (1) Voice tone—*i.e.*, frequency of laryngeal puffs—intensity and timbre—*i.e.*, shape of puff ; and (2) resonance effects. Speech curves show that constant vowels do not exist, the character changing from moment to moment.—C. L. E.

13. Untersuchungen über die Kinderstimme. E. Fröschels (*Zntrlbl. f. Physiol.*, 1920, **34,** 477-84).—Observations on singing and speech, and on defects of speech from phonetic standpoint.—C. L. E.

14. On the Influence of the Increase of the Osmotic Pressure of the Fluids of the Body on Different Cell Substrata. S. de Boer (*Konink. Akad. v. Wetensch.*, Amsterdam, 1918, **21,** 151-7).—Frogs placed in hypertonic solutions (NaCl or glucose) or in dry air developed a cataract-like opacity of the lens, coma, and Cheyne-Stokes' respirations. The same happened if hypertonic fluids were injected into the blood-stream. These results were obviated if at the same time water was infused into the lymph sac, and also vanished in 24 hours if the frogs were placed in water.—C. L. E.

15. The Life of the White Mouse. W. B. Kirkham (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 196-8).—White mice may give birth to young every month in the year, but

most of the litters come during the warmer months. Males and females are both sexually mature when about 6 weeks old. The gestation period of non-suckling mice is from 18 to 21 days. The average size of litters among white mice is 5, and 16 litters seem to be the limit for one female to bear. Animals of both sexes, if healthy at birth, given reasonably good care, and protected from contagious diseases, have an expectation of life of about 2 years, but females appear to be somewhat shorter lived than males.—D. H. de S.

16. Kälteschwärzung eines Säugetieres und ihre allgemein biologischen Hinweise. W. Schultz (*Arch. f. entwickl. mechanik*, 1920, **47,** 43-75).—The author succeeded in changing the normal white hair of the Russian rabbits into black hair by means of cold, also when the rabbits live in darkness.—H. W.

17. The Inheritance of Acquired Characters. E. W. MacBride (*Sci. Progress*, 1921, **15,** 392-405).—This important biological question rises into prominence every now and then, and readers of the letters in *Nature* will be aware that the present is one of these times. This article admirably summarises recent work and views on the subject. Weismann was the apostle of the doctrine that such characters are not inherited, and thus introduced much disputation into the biological world, the workers in which at that time were imbued with the opposite Lamarckian view, taken up as it was in modified form by Darwin and Haeckel. It is proverbially difficult to prove a negative, but Weismann and the Mendelians took a firm stand that acquired characters can have played no part in evolution, and held that no positive evidence to the contrary had ever been adduced. This statement is no longer tenable; Kammerer's work on tadpoles is one instance (this is described by Prof. MacBride at some length); and another and still more clinching piece of evidence has already appeared in these abstracts (see Guyer and Smith, Abstract No. 2065, Vol. V., p. 329), where the injection of a cytolysin which dissolves the lens in rabbits produced defective lenses in six subsequent generations without any further injection. The concession of the principle of use-inheritance will throw light on many puzzles in palæontology and embryology.—W. D. H.

18. Bemerkungen zur Analyse des Reizgeschehens und der funktionellen Anpassung, sowie zum Anteil dieses Anpassung an der Entwicklung des Reiches der Lebeswesen. W. Roux (*Arch. f. Entwicklungsmech. d. Org.*, 1920, **46,** 485-536).—An essay which must be consulted in the original; the main topics discussed are vitalism and functional adaptation, and the part played by the latter in organic evolution.—T. R. P. (*Ber. ü. Pd. ges. hysiol.*).

METHODS

19. Tiefblutforschungen. I. Die Vasostomie. E. S. London and N. P. Kotschnew (*Zeit. physiol. Chem.*, 1920, **111,** 272-9).—Description of operative technique for leading and attaching deep-lying bloodvessels to the abdominal wall. Specially constructed cannulæ are then attached to the vessels, so that the needle of a syringe may be introduced.—H. W. D.

20. The Utilisation of the Ciliary Ganglion for Class Work. H. McGuigan (*J. Lab. and Clin. Med.*, 1920, **6,** 161).—The dissection for exposing the ganglion in the dog is described. In most cases it is simpler to enucleate the eye with its extrinsic muscles, and to work with it in saline at 40° C. Such a preparation can be used for at least 15 minutes after removal. Instructions are given for finding the ciliary ganglion; its stimulation gives the greatest possible constriction of the pupil. Care is necessary not to stretch or tear the post-ciliary fibres.—D. H. de S.

21. Kurze Bemerkungen über Curare-Ersatzpräparate. D. Ackermann (*Münch. med. Woch.*, 1921, **68,** 12).—The author points out the advantages of tetramethyl

ammonium chloride as a routine substance for curarising animals in experimental work. —J. H. B.

22. Einfache Vorhof—und Kammerregistrierung am isolierten Froschherzen. C. Amsler (*Schweiz. mediz. Woch.*, 1920, No. 44, 997-8).—Short description of the method —H. W.

23. A Simple Apparatus for Obtaining Blood Specimens. J. W. Hart (*Publ. Health Rep.*, 1920, **35**, 459-60).—An ordinary test-tube is drawn out until it has an opening of $\frac{1}{4}$ in. It is then connected to a stopcock and the stopcock to a syringe or pump. When a vacuum is secured in the test-tube the stopcock is closed, and the syringe disconnected and in its place a needle is inserted. When the needle is placed in the vein the stopcock is opened, and the blood is drawn into the tube by the vacuum.—W. D. H. (*Chem. Abstr.*).

24. Enumeration of Blood-Cells and Bacteria. G. Dreyer (*Lancet*, 1921, i., 219-21). —The principle of the new method is as follows: A standard suspension of birds' corpuscles is prepared; the red cells are separated in the centrifuge and preserved in $HgCl_2$; this keeps well for months. The full details are set forth in the paper. If human blood-cells are to be counted, the specimen after a suitable known dilution is thoroughly mixed with the same volume of the standard suspension; a sample of the mixture is then microscopically examined, the total red cells and the total nucleated red cells are then counted in several fields, and an average struck. One knows beforehand the number of nucleated red cells in the standard per c.mm. The number of non-nucleated discs per c.mm. is then a mere matter of arithmetic. The white cells are similarly enumerated after suitable staining. Owing to the degree of centrifuging the author evidently regards his standard as free from colourless corpuscles, though he does not explicitly say so. The same principle is employed in counting bacteria. This method is stated to be less fatiguing to the eye, it does away with a costly counting chamber, and gives results which differ from those obtained by the old method by less than 0·2%.—W. D. H.

25. A Simple Shaking Device. J. P. Baumberger (*J. Lab. and Clin. Med.*, 1921, **6**, 222).—D. H. de S.

26. Simple Method of Preparing Ultra-Filters. E. Knaffl-Lenz (*Kolloid Zeitsch.*, 1920, **27**, 315-6).—An ultra-filter for use with a Buchner funnel or a Gooch crucible may be prepared as follows: Into a crystallising dish of the same internal diameter as the funnel, or into a porcelain crucible of the same internal diameter as the crucible, a 3% solution of collodion is poured and equally distributed by rotation of the dish. As soon as the ether has evaporated, the dish is filled with water 3 or 4 times, and finally the membrane is removed by loosening it at the edges and allowing water to flow between it and the glass. It is then placed in the Buchner funnel, which contains a filter-paper, and carefully pressed on to the sides and bottom.—W. D. H. (*J. C. Soc.*).

27. A New Nephelometer and the Principles of Nephelometric Measurements. H. Kleinmann (*Kolloid Zeitsch.*, 1920, **27**, 236-41).—A new nephelometer is described, which depends on the measurement of the height of a Tyndall cone in two liquids, one of which is a standard, which produces the same intensity of illumination in a telescope. The essential point which must be insured in all experiments is that the size of the particles in the turbid liquid is uniform.—W. D. H. (*J. C. Soc.*).

28. Sehschärfenuntersuchungen mit Hilfe des Visometers von Zeiss. R. Kirsch (*Arch. f. Ophthalm.*, 1920, **103**, 253-79).—Description of an apparatus by which visual acuity can be measured more exactly than by the usual methods. The apparatus presents to the eye as a visual object a virtual picture at a little distance, which can be varied in size and measured.—H. W.

29. Die Bestimmung des Wasserstoffzahl durch Indikatoren. L. Michaelis (Abstract No. 3237, Vol. V., p. 517). **Correction.**—The attention of readers is directed to an

important correction in the tables given by the author for the new titration method for H-ions. Instead of "Salt error to be added," read "Salt error to be subtracted." It was not until we actually used the method that the error was discovered.—E. C. G.

30. New Indicator. R. W. Kinkead (*Chem. News*, 1921, **122,** 4-5).—By the action of ethyl nitrate on magnesium phenyl bromide a deep blue solution was obtained, which had the properties of an indicator, turning pink with acids and blue with alkalis.—W. D. H. (*J. C. Soc.*).

31. A Composite Reagent for the Estimation of Sodium Chloride in Urine. H. V. Atkinson (*J. Lab. and Clin. Med.*, 1920, **6,** 160).—The silver nitrate, iron alum, and nitric acid used in Volhard's method are made up in one solution.—D. H. de S.

32. Estimation of Urea. A. J. L. Terwen (*Nederl. Tijds. Geneesk.*, 1920, **64,** ii., 875-80).—A modification of the hypobromite method, which is regarded as sufficiently correct for many clinical purposes.—W. D. H. (*J. C. Soc.*).

33. Remarques sur le dosage de l'urée par l'hypobromite de soudre. L. Ambard (*Bull. soc. chim. biol.*, 1920, **2,** 205-8).—Comparison of methods. Removal of any evolved oxygen can be effected by means of sodium hydrosulphite.—J. C. D.

34. Über die gegenseitige Umwandlung von Kreatin in Kreatinin—II. A. Hahn and G. Barkan (*Zeit. Biol.*, 1920, **72,** 305-13).—The authors describe a new method for the total transformation of creatine into creatinine in aqueous solutions and in the urine. The principle of this method consists in the use of transformation of creatine into creatinine with *N* HCl at 60° to 65° C.—H. W.

35. Über den Nachweis der Harnsäure in Niederschlägen. M. Weiss (*Münch. med. Woch.*, 1920, **67,** 212).—Cloudiness due to uric acid or urates can easily be cleared by the addition of 1% permanganate drop by drop in the cold.—J. H. B.

36. Colorimetrische Phenolbestimmung im Harn. M. Weiss (*Biochem. Zeit.*, 1920, **110,** 258-65).—A method based on Millon's reaction.—E. C. G.

37. Ein einfaches Verfahren für Gasanalysen zu physiologischen Zwecken. W. Trendelenburg (*Zeit. Biol.*, 1920, **72,** 141-62). —Description of the method and of a series of investigations made with it.—H. W.

38. A Modification of the Barcroft and Winterstein Microrespirometer. N. K. Adam (*Biochem. J.*, 1920, **14,** 679-85).—Apparatus described and figured.—H. E. R.

39. Über die flüchtigen Öle und ihren Ersatz. P. Mayer (*Zeit. f. wiss. Mikroscop.*, 1920, **36,** 219-56).—A description of the properties of 19 ethereal oils and of their applications in microscopic technique, together with an account of substances which can be used as substitutes. The most difficult to replace is cedar-wood oil.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

40. Über Cholesterinæmie. I. Vergleichende Untersuchungen zur Methode mit besonderer Berücksichtigung der kolorimetrischen Verfahren. J. Feigl (*Zeitsch. f. d. ges. exper. Med.*, 1920, **10,** Heft 3-4).—Colorimetric estimation requires much practice and has other drawbacks; hence numerous published papers are of little value. —H. W.

41. Estimation of Dextrose and Starch by the Alkaline Permanganate Method. F. A. Quisumbing (*Philippine J. Sci.*, 1920, **16,** 581-601).—The author has studied the influence of the concentration of the reacting substances and the conditions of heating on the oxidation of dextrose by potassium permanganate in presence of sodium carbonate. A method of procedure is described which can be applied to the estimation of dextrose; the excess of permanganate is determined by means of standard oxalic acid solution, and from the volume of permanganate reduced the amount of dextrose present is found by reference to a table. The method can be used for the estimation of starch in commercial starch after hydrolysis by acid or diastase, or in flours after hydrolysis by saliva or diastase, but not after hydrolysis by acid.—W. D. H. (*J. C. Soc.*).

42. The Double-Polarisation Method for the Estimation of Sucrose and the Evaluation of the Clerget Divisor. R. F. Jackson and Clara L. Gillis (*Bureau of Standards, Sci. Paper* No. 375, 1920).—This highly technical paper must be consulted in the original. —W. D. H.

43. Method for Estimating Several Sugars in the Presence of Each Other. T. v. Fellenberg (*Mitt. Lebensm. Hyg.*, 1920, **11,** 129-53).—A method applicable to the estimation of raw sugar, invert sugar, dextrose, maltose, and lactose when three are present in the same solution is proposed. It is based on the action of a weak and a strong inversion and a decomposition with sodium hydroxide of the various sugars present, with subsequent reduction of a copper solution, followed by an iodometric titration of the cuprous oxide formed. For details of calculation and procedure the original must be consulted. Examples of its application to infant foods, commercial glucose, etc., are given.—W. D. H. (*J. C. Soc.*).

44. Estimation of Small Quantities of Sugar in Urine, including the Polysaccharide Content of Human Urine. S. R. Benedict (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 183). —Conditions have been found for carrying out the reaction between sugar and picric acid which make it possible to determine sugar in the presence of 3 or 4 times its weight of creatine or creatinine without affecting the results. The procedure is to be described in detail later. By this method, the increase in reducing substance in normal urine from mild hydrolysis with hydrochloric acid amounts to about 0·5 gm. per day. Much higher figures have been observed in cases of diabetes mellitus.—D. H. de S.

45. Iodometric Estimation of Sugars. J. L. Baker and H. F. E. Hulton (*Biochem. J.*, 1920, **14,** 754-6).—Applicability and accuracy of the method were examined; the method has its limitations, but it is difficult to ascertain the authors' conclusions from their paper.—H. E. R.

46. A Clinical Method for the Determination of Blood-Sugar in Minute Quantities of Blood. I. S. Kleiner (*J. Amer. Med. Assoc.*, 1921, **76,** 172-3).—A modification of Benedict's method, arranged for 0·2 c.c. blood. A new microcolorimeter is used for the matchings.—C. L. E.

47. Modifications à la méthode Bertrand pour rendre cette méthode applicable au dosage de petites quantités de sucre. L. Ambard (*Bull. soc. chim. biol.*, 1920, **2,** 203-5). —Small modifications of the original technique.—J. C. D.

48. The Iodometric Determination of Copper and its use in Sugar Analysis. I. Equilibria in the Reaction between Copper Sulphate and Potassium Iodide. II. Methods for the Determination of Reducing Sugars in Blood, Urine, Milk, and other Solutions. P. A. Shaffer and A. F. Hartman (*J. Biol. Chem.*, 1921, **45,** 349-64, 365-90).—The equilibrium between cuprous and cupric salts with iodine and with iodides was studied, and the conditions determined under which the estimation of cuprous and cupric salts may be carried out. The addition of oxalate shifts the equilibrium, so that the estimation of cuprous copper may be carried to completion. Formulæ are given for solutions for the estimation of sugar using iodine as the end-point for the estimation of either cuprous or cupric copper. The methods are applied to the estimation of sugar in urine, milk, and blood.—H. E. R.

49. An Easy Method for the Distinction and Estimation of Lactose and Glucose in Urine. A. P. Matthews (*J. Amer. Med. Assoc.*, 1920, **75,** 1568-9).—Ferment with a large amount of yeast for an hour. The difference of reducing power represents glucose. Lactose can be identified as osazone in the filtrate.—C. L. E.

50. Estimation of Lactose in Milk. R. G. Owen (*J. Lab. and Clin. Med.*, 1921, **6,** 220-1).—The method of Folin and Wu for the estimation of blood-sugar (see Abstract No. 823, Vol. V., p. 128) is used for the estimation of lactose.—D. H. de S.

51. Apparatus for Staining and Drying Slides. F. H. Lamb (*J. Lab. and Clin. Med.* 1920, **6,** 101-2).—D. H. de S.

52. Trichloraethylen in medizinischer Verwendung. J. Saphier (*Münch. med. Woch.*, 1920, **67,** 133).—$C.Cl_2$:CHCl is a cheap and efficient substitute for xylol in histological work.—J. H. B.

53. Beiträge zur Kohlensäurebestimmung in der Luft. J. Freund (*Zeitsch. f. Hygiene u. Infect. Krankh.*, 1920, **91,** 218-22).—Description of a new method, which is stated to be as good as Pettenkofer's, but is simpler.—H. W.

CHEMICAL

54. Electrolytes and Gels—II. G. S. Adair (*Biochem. J.*, 1920, **14,** 762-79).—Mathematical discussion of the method for measuring diffusion, using a gel containing an indicator.—H. E. R.

55. Sorption by Cellulose (Filter-Paper). K. Scheringa, (*Pharm. Weekblad.*, 1920, **57,** 1289-94).—Absorption or adsorption by cellulose is largely due to its capillary structure. With many neutral salts there is no adsorption; heavy metals and alkaloids may be adsorbed from very dilute neutral solution, but not from acid solution; alkalis may be adsorbed, partly due to impurities in the cellulose. Positive colloids (as metal oxide sols) are strongly adsorbed by coagulation, while negative colloids (as sulphide sols) are not, and so pass readily through filter-paper. Albumin is adsorbed from very dilute acid solution, but not from urine, which probably contains substances which inhibit the adsorption. Filter-paper may therefore be safely used to *filter urine for albumin analysis.* The above experiments were made with filter-paper dried at 120°. Air-dried paper, which may contain as much as 20% moisture, gives different results. Starch, a much more disperse system than cellulose, shows selective adsorption, negative with NaCl, positive with $CuSO_4$ in very dilute solution, but negative in more concentrated solution.—W. D. H. (*Chem. Abstr.*).

56. Ion Series and the Physical Properties of Proteins. III. The Action of Salts in Low Concentration. J. Loeb (*J. Gen. Physiol.*, 1921, **3,** 391-414).—Ions of opposite sign to a protein ion diminish swelling, osmotic pressure, and viscosity. Those of the same sign (except H and OH) have no effect unless in high concentration. The magnitude of the effect is a function only of the valency and the sign of the ion. The Hofmeister series results from neglecting the effect of salts on H-ion concentration. Conclusions cannot be drawn when the electrolyte exceeds $m/16$, since here the properties of the protein ion are near the minimum characteristic of the isoelectric point.—W. M. B.

57. Étude de quelques phénomènes osmotiques dans un champ électrique alternatif. L. A. Pelous (*J. de physiol. et de pathol. gén.*, 1920, **18,** 1115-31).—The rate of endosmosis into a Pfeffer cell is increased by placing it in a static alternating field of high tension. The effect is greater in dilute than in more concentrated solutions, and with saccharose than with potassium nitrate. It rises with increasing potential, at first rapidly, then more slowly. There is reason to believe that there is an optimal rate of alternation, since with low rates the effect increases with the rate, but with high rates it decreases. The increase in rate of osmosis persists for some time after exposure in the case of an electrolyte; in that of sugar, the cessation of the electric field is followed by a depression in rate. Substances in the colloidal state behave like sugar. The author suggests in explanation hypotheses which are not altogether satisfactory. Plasmolytic experiments on Spirogyra showed a similar increase of rate of osmosis. Light also was found to produce an increase in the rate of inflow of water into sugar solutions. But it is not clear that the effect of increase of temperature was excluded.—W. M. B.

58. Eine mikroskopische Überführungsmethode. Studien über Eiweissreaktionen—I. A. v. Szent-Györgyi (*Biochem. Zeit.* 1920, **110,** 116-8).—The author gives a little diagram

of non-polarisable electrodes applied to a moist coverslip for determination of the isoelectric point; probably many have used this arrangement before.—E. C. G.

59. Disodium Phosphate as a Catalyst for the Quantitative Oxidation of Glucose to Carbon Dioxide with Hydrogen Peroxide. E. J. Witzemann (*J. Biol. Chem.*, 1920, **45,** 1-22).—Glucose is quantitatively oxidised to CO_2 by H_2O_2 in the presence of disodium phosphate. The result is not due to hydroxyl ions, as carbonates and bicarbonates do not produce a like effect. Disodium phosphate does not promote oxidation of glucose by atmospheric oxygen.—H. E. R.

60. Eine einfache Methode zur Darstellung von Kreatin aus Fleischextrakt. H. Steudel (*Zeit. physiol. Chem.*, 1921, **112,** 53-4).—Liebig's extract is treated with boiling alcohol. The alcoholic extract is evaporated, and creatine crystallises out of the mother liquor.—H. W. D.

61. Über die Oxydation der Acetessigsäure. N. O. Engfeldt (*Zeit. physiol. Chem.*, 1921, **112,** 176-86).—A solution of sodium aceto-acetate is oxidised to oxalic acid by permanganate, and glyoxylic acid can be detected as an intermediate product.—H. W. D.

62. Über die quantitative Bestimmung von Aceton und Aldehyd in ein und derselben Flüssigkeit. W. Stepp and W. Engelhardt (*Biochem. Zeit.*, 1920, **111,** 8-16).—The iodoform method gives results much too low. The bisulphite method gives accurate results. With the mixture of aldehyde and acetone, the two are estimated first together by the bisulphite method, then the acetone is estimated in a separate experiment after removing aldehyde by boiling under a reflux condenser with silver oxide. In the bisulphite method heating should be continued for 40 hours.—E. C. G.

63. Dosage de traces d'acide cyanhydrique dans un milieu complexe. Applications biochimiques et toxicologiques. L. Chelle (*Bull. soc. chim. biol.*, 1920, **2,** 180-201).—The disappearance of reactions for hydrocyanic acid shortly after death appears to be due to the formation of sulphocyanides. It is therefore possible to regenerate the hydrocyanic acid for purposes of estimation in medico-legal cases.—J. C. D.

64. The Contrary Action of Soluble Chlorides and Sulphates on Starch. H. Courtonne (*Compt. rend.*, 1920, **171,** 1168-70).—In the presence of soluble chlorides, starch is slowly converted at the ordinary temperature into a gelatinous mass of amylopectin, which is, in turn, converted into soluble starch if the mixture is heated at 115°. The ease with which these changes take place depends on the solubility of the chloride and its concentration. A saturated solution of magnesium chloride is the most effective. Sulphates, on the other hand, retard this change.—W. D. H. (*J. C. Soc.*).

65. Synthese von Schwefel- und Selen-haltigen Zuckern. F. Wrede (*Zeit. physiol. Chem.*, 1920, **112,** 1-12).—The tetrasaccharide, dicellosylselenide, the trisaccharide, cellosyl-glucosylselenide, and the disaccharide, galactosyl-glycosylselenide, and derivatives are described.—H. W. D.

66. Constitution of Disaccharides. V. Cellobiose. W. N. Haworth and E. L. Hirst (*J. Chem. Soc.*, 1921, **119-120,** 193-201).—Cellobiose (cellose) bears the same relationship to cellulose as maltose does to starch. Both sugars yield on hydrolysis two molecular proportions of glucose. Their constitutional formula is, however, different. This and other purely chemical details are treated at length.—W. D. H.

67. Über die Auflösung von Zellulose in Salzen der Alkalien und Erdalkalien. R. O. Herzog and F. Beck (*Zeit. physiol. Chem.*, 1920, **111,** 287-92).—It has been stated that cellulose will form a plastic mass and also a colloidal solution with concentrated aqueous salt solutions. This statement is shown to be true only in a limited sense. It is found that the solution of cellulose in such salt solutions is a function of the hydration of the ions. The greater the degree of hydration the greater is the solubility.—H. W. D.

68. Constitution of Cellulose. K. Hess (*Helv. Chim. Acta*, 1920, **3,** 866-9).—A reply to criticisms by Karrer. Hess regards cellulose as a complex of " celluxose " (" hydro-

cellulose ") systems, held together by virtue of the residual affinities of the hydroxyl groups, the components themselves having definite chemical structure, being, in fact, tannin-like units derived from dextrose. Karrer, on the other hand, sees in the relationship of a simple cellulose or starch molecule to the whole fibre or grain something akin to the relationship between a single molecule and a rigid crystal. —W. D. H. (*J. C. Soc.*).

69. Separation of the Highly Unsaturated Fatty Acids in Fish Oils. M. Tsujimoto (*J. Chem. Ind. Japan*, 1920, **23**, 1007-10).—The method depends on the ready solubility of the lithium salts of the highly unsaturated acids in acetone containing a little water (95% acetone by volume) and the insolubility or sparing solubility of the saturated and less unsaturated acids in the same solvent. The amounts of the acids obtained by the method are considerably higher than those calculated from the yields of the polybromides. The author assigns the formula $C_{22}H_{34}O_2$, in place of $C_{18}H_{28}O_2$, to clupanodonic acid, which he isolated from Japanese sardine oil.—W. D. H. (*J. C. Soc.*).

70. Estimation of Phosphatides. D. H. Brauns and J. A. MacLaughlin (*J. Amer. Chem. Soc.*, 1920, **42**, 2238-50).—The phosphatides are extracted from the material previously dried, if necessary, with anhydrous sodium and calcium sulphates, with alcohol at 50° to 60°. The alcoholic extracts are evaporated to dryness and extracted with anhydrous ether. The ethereal extract is evaporated to 30 to 40 c.c. and extracted with a saturated solution of sodium chloride, the ethereal layer being separated, the ether removed, and the residue dried and weighed. In this material the phosphorus is estimated colorimetrically, as described by van Eck. As a check, another portion of the extracted phosphatide may be hydrolysed by acid, and in the product the choline may be estimated as its platinichloride and the amino-nitrogen by Van Slyke's method. —W. D. H. (*J. C. Soc.*).

71. Untersuchungen über die Gallensaüren. VI. Beiträge zum Abbau der Desoxybiliansäure. H. Wieland and A. Kulenkampff (*Zeit. physiol. Chem.*, 1920, **108**, 295-305).—Desoxybilianic acid is obtained in excellent yield by oxidising desoxycholic acid with fuming HNO_3. On distillation in high vacuum desoxybilianic acid loses 1 mol. CO_2 and 1 mol. water, giving a monobasic acid containing an additional CO group. This acid, called " pyrodesoxybilianic acid," is readily oxidised by $KMnO_4$, giving a new dibasic acid. The constitution of these acids is discussed in the light of the experimental findings.—H. W. D.

72. Untersuchungen über die Gallensäuren. VII. Zur Kenntnis der Choloidansäure. H. Wieland (*Zeit. physiol. Chem.*, 1920, **108**, 306-30).—Choloidanic acid is not, as previously supposed, a derivative of cholic acid, but of desoxycholic acid. Its formula is $C_{25}H_{38}O_{11}$, and on distillation in a high vacuum it gives pyrocholoidanic acid, $C_{23}H_{32}O_6$, titrating with hot alkali as a tribasic acid. The so-called pseudocholoidanic acid has a formula $C_{22}H_{32}O_9$, and is a tetrabasic ketonic acid formed by energetic oxidation of desoxybilianic acid with HNO_3.—H. W. D.

73. Zur Kenntnis der Gallensäuren—VIII. M. Schenck (*Zeit. physiol. Chem.*, 1920, **112**, 38-44).—Biloidanic acid ($C_{19}H_{28}O_{10}$), obtained by the action of HNO_3 on bilianic acid, is shown to be identical with an acid previously described by Letsche (1909).—H. W. D.

74. Uric Acid. L. Dozzi (*Gazz. ospedaliclin.*, 1920, **41**, 17-8).—Pure uric acid precipitated in the presence of a colloidal colouring matter adsorbs it, but not if the pigment forms a true solution.—W. D. H. (*Chem. Abstr.*).

75. Über die freien Amidogruppen der Eiweisskörper. S. Edlbacher (*Zeit. physiol. Chem.*, 1921, **112**, 80-5).—Methyl casein was hydrolysed, and the following N-methyl values obtained: Monamino-acid fraction, 0; histidine-arginine fraction, 7·5; lysine fraction, 73·4. Whether the casein contained mainly trimethylated N, although

probable, is not definitely proved. The relation of the results to those of Felix and Herzig is discussed.—H. W. D.

76. Nachweis von Pyrrolkörpern in den Proteinstoffen. N. Troensegaard (*Zeit. physiol. Chem.*, 1921, **112,** 86-103).—An interesting paper developing the theory that the protein molecule contains complexes built up of hydroxypyrrol (or similar) rings, which are split on hydrolysis with formation of amino-acids. Proteins are thus brought into relationship with hæmatin and chlorophyll. In support of this theory the author has isolated 6% of the total nitrogen of gliadin, and 3·5% of the total nitrogen of gelatin as mixtures of unidentified pyrrol derivatives. The experimental evidence is thus only slender. A difficulty which is not mentioned in the paper seems to lie in the fact that amino-acids produced by the opening (by acid hydrolysis) of a hydroxypyrrol ring as depicted would be optically inactive.—H. W. D.

77. Mitteilungen aus dem Gebiete der Eiweisschemie. I. Über Jodbindungsfähigkeit und Konstitution der Proteine. F. Blum and E. Strauss. **II. Über Jodglobin.** E. Strauss and R. Grutzner (*Zeit. physiol. Chem.*, 1921, **112,** 111-66, 167-75).—I. When proteins, dissolved in $NaHCO_3$ solution, are treated with a solution of iodine in KI, some of the iodine enters the benzene ring of tyrosine and some replaces the H of an imide group. This latter N-iodine is easily removed by reduction with SO_2. The N-iodine and C-iodine bear a constant relation to each other, whence calculations of the minimum possible molecular weight of the proteins can be made. Assuming that the N-iodine is found in the iminazol ring of histidine, conclusions concerning the probable distribution of tyrosine and histidine can be drawn. The iodisation of proteins is accompanied by secondary changes, tryptophane and cystine being readily attacked. The presence of N-iodine and the heating of the iodo-proteins containing only C-iodine render these substances resistant to peptic digestion. II. An application of the method described above to globin. The fully iodised protein contained 11·4% iodine; after removal of the N-iodine it contained 7·6% iodine, whence a molecular weight of 3,214 is deduced for globin.—H. W. D.

78. Chemical Constitution of Tussore Silks. R. Inouye, S. Iwaoka, and M. Hirasawa (*J. Tokyo Chem. Soc.*, 1920, **41,** 876-98).—The silk layers of tussore cocoons from Japan (I.) and Manchuria (II.) were hydrolysed with HCl, with the following results (figures in parenthesis show the percentages in I. and II.): Glycine (12·38, 16·80), alanine (15·27, 11·87), leucine (0·27, 0·25), aspartic acid (2·37, 4·08), glutamic acid (trace, trace), serine (0·55, 0·47), proline (0·26, 0·23), hydroxyproline (—, 0·18), phenylalanine (0·37, 1·18), and tyrosine (6·62, 3·86). These figures are compared with those of Japanese, Indian, and Chinese cocoons.—W. D. H. (*J. C. Soc.*).

79. Über eine neue Spaltungsmethode der Nucleinsäure. H. Steudel and E. Peiser (*Zeit. physiol. Chem.*, 1920, **111,** 297-303).—A very mild hydrolytic agent which does not produce humin-like substances is found in calcium bisulphite solution. The sulphurous acid present probably protects the reactive groups of the carbohydrates liberated by hydrolysis. The method is found to be excellent for preparing "Thyminsäure" (thymic acid), which has hitherto been obtainable only with great difficulty. (The authors suggest that this acid should in future be known as "Thymosinsäure" (thymosinic acid.)—H. W. D.

80. Neue Darstellungsmethoden von Nukleinsäuren. R. Feulgen (*Zeit. physiol. Chem.*, 1920, **111,** 257-72).—Nucleoprotein is subjected to alkaline hydrolysis. The guanylic and pancreas-nucleic acids formed are purified by precipitation with alcohol. The secondary sodium salt of guanylic acid is separated from that of pancreas-nucleic acid by salting out of neutral solution with sodium acetate. On dissolving the secondary sodium salt of guanylic acid in *N* NaOH and adding alcohol a syrup (the tertiary sodium salt) is precipitated which becomes crystalline.—H. W. D.

81. Experimentelle Studien über den Nucleinstoffwechsel. X. Die Desamidierung der Triphosphonucleinsäure. S. J. Thannhauser and P. Sachs (*Zeit. physiol. Chem.*, 1921, **112,** 187-92).—The question has been raised as to whether the triphosphonucleic acid produced by mild hydrolysis of yeast nucleic acid is a single substance or a mixture. To settle this point the acid prepared as above and triphosphonucleic acid prepared by repeated recrystallisation of the brucine salt have been deaminised. The same product was obtained in each case. Thus the triphosphonucleic acid in question must be a definite chemical compound.—H. W. D.

82. Pentose Mononucleotides of the Pancreas of the Dogfish (Squalus Sucklii). C. Berkley (*J. Biol. Chem.*, 1921, **45,** 263-75).—β-nucleoprotein from the pancreas of the dogfish contains both adenine and guanine in pentose mononucleotide combination. The β-nucleoprotein is readily broken down into its constituent mononucleotides by cold 1% NaOH.—H. E. R.

83. Studien über die Adsorption von Aminosäuren, Polypeptiden und Eiweisskörper durch Tierkohle—I. E. Abderhalden and A. Fodor (*Kolloid-Z.*, 1920, **27,** 49-58).—Study of the adsorption by charcoal of *l*-leucine and glycyl-*l*-leucine, when dissolved separately or when mixed, shows that the chemical equivalents adsorbed, whether from a single solute or from a mixed solution, are equal, but that from the mixture the longer chain is adsorbed to a greater extent than the shorter one. The addition of neutral salts to solutions at first decrease the amount adsorbed, but with increasing concentration of the salt the adsorption is increased, even (in the case of *l*-leucine) beyond that from water solution. Lowered adsorption is probably due to increased hydration of the dissolved material, increased adsorption to decreased hydration. The order of the anions of the neutral K salts in causing decreased adsorption is about the same as Hofmeister's series for precipitating proteins. In each case SO_4 (highly hydrated, and therefore lowering the hydration of the dissolved amino-acid) comes first, favouring precipitation and adsorption; CNS comes last. Yeast proteins and casein show likewise that dehydrated and coarsely dispersed proteins (from solutions containing salts) are more readily adsorbed than the more highly hydrated.—W. D. H.

84. Über ein tryptophanhaltiges Tripeptid aus Casein. S. Fränkel and E. Nassau (*Biochem. Zeit.*, 1920, **110,** 287-98).—The authors describe the isolation of a tripeptide containing two tryptophane groups and one alanine. The substance was obtained as an inactive barium salt by alkaline hydrolysis of casein. Its formula is $C_{25}H_{27}N_5O_4$. There are various possibilities for its constitution.—E. C. G.

85. Can Casein Introduced Parenterally Produce a Strong Protein Action owing to its Physical-Chemical Properties? R. Riedel (*Deut. med. Woch.*, 1920, **46,** 881-2).—From the absence of glycine and presence of relatively large amounts of tyrosine and tryptophane, as well as from the fact that casein is attacked by erepsin, it is assumed that it is easily decomposed in the organism. On intravenous injection erepsin is supposed to split off quickly, mono- and diamines stimulating cells to the activation of ferments. The high optical activity of casein may play some rôle.—W. D. H.

86. Humin formed by Acid Hydrolysis of Proteins. VI. Acid Hydrolysis of Tryptophane. G. E. Holm and R. A. Gortner (*J. Amer. Chem. Soc.*, 1920, **42,** 2378-85; compare Abstract No. 739, Vol. V., p. 115).—Parts of the tryptophane molecule are broken down by long acid hydrolysis, but in the absence of aldehyde contribute but little to "acid-insoluble" humin. More appears in "soluble" humin after 144 hrs. of boiling with 20% HCl. A normal protein hydrolysis occupies 24 hrs., so that humin cannot be largely formed from tryptophane unless some reactive compound such as aldehyde intervenes. Tryptophane is easily deaminised by boiling 30% HCl, and thus may contribute to ammonia formation. When tryptophane has been boiled with 20%

HCl, the nitrogen distribution is such as to render errors in a Van Slyke estimation probable.—W. D. H.

87. Action of Nitrous Acid on Arginine and Histidine. H. Sekine (*Nogakukaiho*, Tokyo, 1919, i., 197).—Arginine loses half of its N during treatment with HNO_2 at 20° C. for 30 mins. Van Slyke's formula for calculating histidine should be amended to: Histidine N $=\frac{3}{2}$ (D—$\frac{1}{2}$ arginine N).—W. D. H. (*Chem. Abstr.*).

88. The Amphoteric Properties of Some Amino-Acids and Peptides. H. Eckweiler, Helen M. Noyes, and K. G. Falk (*J. Gen. Physiol.*, 1921, **3**, 291-308).—Titration curves of a series of amino-acids, dipeptides, acetone, urea, acetic and aceturic acids were obtained. Also the isoelectric points of some amphoteric electrolytes were determined and the significance of this property discussed.—W. M. B.

89. Limites de précipitation de la mucin par les acides et par les sels de zinc. L. Dejust (*Bull. soc. chim. biol.*, 1920, **2**, 208-70).—Mucin prepared from submaxillary glands of oxen contained 13·69% of nitrogen. Its precipitation was studied.—J. C. D.

90. Die Wirkung der Elektrolyte auf das Serumalbumin; Studien über Eiweissreaktionen—II. A. v. Szent-Györgyi (*Biochem. Zeit.*, 1920, **110**, 119-27).—The author adds salts to a protein suspension and observes under the microscope to which pole the particles wander when the current is passing; he concludes that monovalent kations have no directive effect, but other kations exert a directive influence varying with the concentration. Unfortunately the list of substances tried contains many which dissociate, yielding hydrion, which makes it difficult to say what the true effect of the kations may be.—E. C. G.

91. Preparation of Fibrinogen. J. McLean (*Bull. Johns Hopkins Hosp.*, 1920, **31**, 453).—Fibrinogen prepared in the usual way with NaCl as the salting-out agent is frequently very difficult to dissolve, especially after 2 or more precipitations. This difficulty does not occur if ammonium sulphate is used instead, and the final product is freer from prothrombin. Centrifugalised oxalated plasma (cat or dog) was used, and a quarter of its volume of saturated $(NH_4)_2SO_4$ solution added; the material is purified by washing in the centrifuge, dissolved in 2% NaCl, again salted out, and so on. Two precipitations are usually enough. The solution does not clot spontaneously or in adding $CaCl_2$; it clots in a few minutes on adding Ca and thrombin or prothrombin.—W. D. H.

92. Action sur l'oxyhémoglobine des corps de la famille du cyanogène. F. Vlès (*Bull. de la soc. de chim. biol.*, 1920, **2**, 223-38).—A very complex scheme of the hæmoglobin derivatives. The name hæmochromogen is retained (see Abstract 2012, Vol. IV., p. 324), and still further complication is introduced by the assumption that there are several hæmochromogens. One to which special attention is drawn is termed cyanogen hæmochromogen, which is obtained by reduction in alkaline solution by sodium hydrosulphite in presence of a cyanide. A similar substance is stated to be found *in vivo* in cases of cyanide poisoning.—W. D. H.

93. Récherches sur l'hémocyanine—V. C. Dhéré (*J. de physiol. et de pathol. gén.*, 1920, **18**, 1081-93).—Solutions of oxyhæmocyanin show two bands in the ultra-violet—one from 293 $\mu\mu$ to 263 $\mu\mu$, the other, first appearing in deeper layers, from about 357 $\mu\mu$ to 317 $\mu\mu$, with its centre at 346 $\mu\mu$. The former band is common to most proteins, and is due to phenyl-alanine, tyrosine, or tryptophane. The latter band appears to be due to the copper-pyrrol complex, not, however, being linked with the copper itself. It corresponds to the γ-band of hæmoglobin. The band in the visible violet is stated to be due to copper.—W. M. B.

94. Ricerche chimiche e chimico-fisiche sulla emocianina. I. L'indice di refrazione dell'emocianina. II. Le proprieta colloidali e il punto isoelettrico dell' emocianina. G. Quagliariello (*Arch. Sci. Biol.*, 1920, i., 246-58; *Atti R. Acc. med. chir. Napoli*,

1920, **74,** reprint, pp. 31).—I. The refractive index of aqueous solutions of hæmocyanin is in direct relation to the concentration. It may be expressed by the formula $\frac{n-n_o}{C}=k$, in which n is the refractive index of the solution, n_o that of the solvent, C the percentage concentration of the hæmocyanin, k a constant (the specific refraction of hæmocyanin). It causes an increase in the refractive index of the water when 1 gm. is dissolved in 100 c.c. of water or of an acid, basic, or salt solution, which is equal to 0·00197. If the refractive index of the solvent is known, it is possible by means of the formula to find the exact percentage of a solution of hæmocyanin up to 2%. The difference between n and n_o is between 10° and 30° C., independent of variations in the temperature. II. This deals with properties of hæmocyanin. It is completely precipitated by dialysis. The precipitation begins soon, but it takes about 30 days to be complete. Hæmocyanin thus appears to be nearer to the globulins than to the albumins. The opinion expressed by Alsberg and Clark that it behaves sometimes as an albumin (*Octopus*), sometimes as a globulin (*Limulus*), could not be confirmed. It is not possible to obtain a neutral hæmocyanin in Pauli's sense (viz., coagulable by heat and alcohol, but not precipitated by a trace of dilute $CuSO_4$), because it precipitates as soon as it becomes neutral. Dhéré's observation that after a period of dialysis hæmocyanin is no longer coagulated either by heat or by alcohol is confirmed, but in this hæmocyanin does not differ from hæmoglobin or any other protein. In contradiction to Krukenberg's statement, hæmocyanin can be in part precipitated from blood by simply diluting it with distilled water. Solutions of dialysed hæmocyanin (about 1%) are not coagulated by heat and alcohol. NaCl and Na_2SO_4 partially precipitate hæmocyanin from its solutions, but only up to a point; a complete salting out may be obtained by means of $MgSO_4$ or Am_2SO_4. Details are given of the action of other protein precipitants. In an electric field dialysed hæmocyanin behaves as an amphoteric electrolyte, but its acidic tendencies are the greater. The minimum of its solubility corresponds to its isoelectric point.—C. d. F.

95. Zur Technik der Darstellung der Teichmannschen Häminkrystalle. G. Strassmann (*Münch. med. Woch.*, 1920, **67,** 748-9).—Teichmann's crystals are very easily prepared by the use of a mixture of 1 part of 5% sodium chloride and 3 parts of glacial acetic acid.—J. H. B.

96. Versuche zur Darstellung hochactiver Saccharase-präparate. O. Svanberg (*Zeit. physiol. Chem.*, 1921, **112,** 104-10).—An unsuccessful attempt to purify saccharase solutions by filtration through a membrane.—H. W. D.

97. Sur l'emploi des divers agents de précipitation dans la préparation de l'émulsine des amandes. M. Bridel and R. Arnold (*Bull. soc. chim. biol.*, 1920, **2,** 216-22).—If the precipitation of emulsin is carried out by means of methyl alcohol or acetone instead of ethyl alcohol, and prolonged contact with the precipitating agent is prevented, a product is obtained which possesses the properties of ordinary emulsin. Prolonged contact with the precipitating liquid appears to remove certain of the fermentative properties of the emulsin preparation.—J. C. D.

98. Das Koferment (Komplement) der Diastasen. W. Biedermann (*Fermentforsch.*, 1921, **4,** 258-300).—Both animal and vegetable diastases consist of a thermolabile (organic) component (zymogen or proferment) which is by itself inactive and of a thermostabile coferment or activators (the ions of numerous salts). Dialysis does not yield totally inactive solutions, but the absorption of the organic component by glass is a method by which such inactive ferments can be obtained. In the coferment anions have the chief effect, but the cations are not without influence. NaCl and potassium thiocyanate have the greatest effect, then KCl, KBr, NaBr, NH_4Cl, the chlorides of Ca, Mg, Sr, Ba, the nitrates, iodides, and sulphates follow in order. Very small quantities

of the salts can activate various quantities of the proferment. The optimum occurs at the neutral point. The smallest addition of free acid or alkali is sufficient to inhibit the effect and then to destroy the enzymes. Unsaturated salts act in another way. Not only the primary alkaline phosphates, but also acid sodium citrate (0·3%), activate salt-free diastase in spite of their reaction. Inhibition is the result of higher concentrations. The secondary phosphates and $NaHCO_3$ activate in concentrations which in acid salts cause inhibition (1%). H-ions cause absolute inhibition sooner than the same increase of OH-ions. But the inhibition is much greater under the influence of the diphosphates and the bicarbonate than in monophosphate solutions of the same concentration. This relative inhibition of the diphosphate diastase can be suddenly removed by the smallest additions of NaCl (or similar neutral salt) without change of the reaction. Addition of NaCl to a neutral phosphate mixture causes a diastatic activity which surpasses all other combinations with neutral salts. Mixed human saliva contains such a combination of inorganic salts, which has the best effect on the activity of the proferment. This combination of ions is the same, which effects the "autolysis" of amylose, as shown in the author's earlier work.—H. W.

99. Zur Kenntnis der Urease. Zugleich ein Beitrag zum Studium der Giftwirkungen. P. Rona and P. György (*Biochem. Zeit*, 1920, **111,** 115-33).—Brings no new facts to our notice.—E. C. G.

100. Studium der Giftwirkungen. Über die Giftwirkung des Thiodiglykols und seiner Derivate an Sojabohnenurease. P. Rona and H. Petow (*Biochem. Zeit.*, 1920, **111,** 134-65).—Thioglykol does not inhibit urease action, but the chloro-derivative does. This poisonous action of the chloro-compounds is correlated with the change in acidity which results from their hydrolysis, whereas with the thio-compounds there is no change in acidity.—E. C. G.

101. Studium der Giftwirkung. Über die Wirkung des Atoxyls auf Serumlipase. P. Rona and E. Bach (*Biochem. Zeit.*, 1920, **111,** 166-88).—When the concentration of the poison is increased geometrically, the velocity of the ferment process diminishes arithmetically. Lipase ferments from different animals show different degrees of sensitiveness to the poison. Tributyrin protects the ferment in a measure against the action of the poison.—E. C. G.

102. A Determination, by Means of a Differential Calorimeter, of the Heat produced during the Inversion of Sucrose. H. H. Dixon and N. G. Ball (*Sci. Proc. R. Dubl. Soc.*, 1920, **16,** 153-64).—Using an apparatus similar in character to that of Hill, the authors have determined the heat of inversion of sucrose by invertase, and obtain the value 3·83 cal. per gram-molecule, which is in close agreement with the value obtained by Brown and Pickering. Attempts to obtain a value for the heat of reaction during the hydrolysis of maltose were not successful.—W. D. H. (*J. C. Soc.*).

PHYSIOLOGY OF INVERTEBRATES

103. Food Reactions of Amœba Proteus. W. A. Kepner and W. C. Whitlock (*J. exp. Zool.*, 1921, **32,** No. 3).—There are two types of reaction to food: (*a*) When no contingency of escape is presented by the prey, the amœba tightly surrounds the food; (*b*) when such contingency is presented, a wide embrace is made and the prey is disturbed only when retreat is cut off. These vary greatly. In reacting to an object that uusally moves in a horizontal plane, the amœba surrounds the prey in this plane first and next cuts off its vertical paths of escape. A reaction is usually brought about through the co-operation of both ectoplasm and endoplasm, though the ectoplasm alone may carry out a reaction of the second type. Both the ectoplasm and endoplasm are

highly contractile when conditions demand it. The cutting of an animal like paramœcium into two is primarily a physical, and not a chemical process, digestion setting in after the prey has been defragmented. The process of ingesting food is a reversible one. Food half, almost, or wholly ingested may be egested. The amœba's reactions differ from physical and chemical phenomena in that they are qualitative rather than quantitative, and are made in the interests of the organism.—W. D. H. (*W. I.*).

104. Untersuchung des Fetts der Gonaden von Rhizostoma Cuvieri. F. Haurowitz (*Zeit. physiol. Chem.*, 1920, **112,** 28-37).—Cholesterol, formic, caprylic, palmitic, myristic, and linoleic acids were found. Stearic and oleic acids could not be detected. The presence of choline and trimethylamine was established.—H. W. D.

105. The Oxidation of Carotene from Crustacea and the Presence of a Substance in the Oxidation Product which gives a Cholesterol Reaction. J. Verne (*Compt. rend. soc. biol.*, 1920, **83,** 980-90).—Carotene extracted from the integument oxidises slowly at ordinary temperature, but more quickly at higher temperatures, or especially with chromic acid. In the course of the oxidation, the carotene becomes decolorised and the absorption bands in the spectrum disappear. When completely decolorised, it is lævorotatory, and the m. p. falls according to the degree of oxidation. The oxidation product is stained by osmic acid and Sudan-red, and gives the cholesterol reactions of Salkowski, Liebermann, and Schiff. The pancreas of lobsters and crabs contains much, the blood a little, and the subcutaneous tissue no cholesterol. The author considers that carotene and cholesterol contain a polycyclic nucleus.—W. D. H. (*J. C. Soc.*).

106. L'instinct paralyseur des araignées. É. Rabaud (*Compt. rend.*, 1921, **172,** 289-91).—It is a mistake to suppose that the spider selects the spot for his fatal bite. He strikes the part of the victim nearest to him, and repeats the stroke till he encounters a penetrable part of the integument.—J. A. M.

107. Inheritance of Wing Colour in Lepidoptera. III. Melanism in Boarmia consortaria. IV. In B. abietaria. H. Onslow (*J. Genetics*, 1920, **9,** 339-46; **10,** 135-40.)—A continuation of the author's study of this subject in 2 other butterflies (compare Abstract No. 98, Vol. V., p. 14).—W. D. H.

108. Neues zur Frage nach einem Farbensinn bei den Bienen. C. v. Hess (*Naturwissensch.*, 1920, **8,** 927-9).—The bees are like other arthropods, totally colour-blind. Exact investigations can only be made with homogeneous spectral light. Mixtures of colours must not contain ultra-violet rays.—H. W.

109. The Normal Bacterial Flora of the Bee. P. B. White (*J. of Path. and Bact.*, 1921, **24,** 64-78).—The author has examined by cultural methods about 1,200 bees. Four new species of bacilli belonging to the adapted flora (constant) are described in detail and are figured; the inconstant adapted flora comprise numerous species, of which two diphtheroids and a streptococcus are most common. The commonest organisms of the casual flora belong to the *B. coli* group. Levinthal's medium was found most suitable for the cultivation of the organisms of the adapted flora.—W. E. G.

110. The Pharyngeal Gland of the Earthworm. D. Keilin (*Quart. J. Micr. Sci.*, 1920, **65,** 33-61).—The bulk of the paper is anatomical. This gland is regarded as a salivary gland, and its secretion enters the pharynx. It is rich in mucin and contains a proteolytic enzyme.—W. D. H.

111. Sur la semiperméabilité biologique des parois extérieures des Sipunculides. G. Dekhuysen (*Compt. rend.*, 1921, **172,** 238-41).—These animals absorb water in a hypotonic, and lose water in a hypertonic, medium. The resulting difference in weight is less in the former than in the latter case.—J. A. M.

112. Carbon Dioxide in Relation to Regeneration in Planaria. H. L. Robbins and C. M. Child (*Biol. Bull.*, 1920, **38,** 103-22).—Changes in CO_2 production following section in pieces of *Planaria dortocephala* run parallel with changes in susceptibility. Tem-

porary excitations are seen following section, and differences are found in pieces from the mouth and head regions. Increase in CO_2 production by new and "old" tissue is seen in regeneration of an individual from a piece. This increase is found before and after feeding. The animal developing from an isolated piece becomes physiologically younger than the animal from which the piece originated.—J. A. H.

113. Natural History of Onchidium. W. J. Crozier (*J. exp. Zool.*, 1921, **32,** No. 3).—An account of the activities of *Onchidium Floridanum*, a member of a group of semi-marine pulmonates long noted for puzzling structural features, and herein shown to exhibit habits not less remarkable. A discussion of sensory responses is followed by a comparative analysis of heliotropism, and especially of "homing" behaviour. Emphasis is placed upon the non-adaptive character of heliotropism in this animal, and upon the mechanistic interpretation of the phenomena of homing.—W. D. H. (*W. I.*).

114. The Response of Popillia japonica to Light and the Weber-Fechner Law. A. R. Moore and W. H. Cole (*J. Gen. Physiol.*, 1921, **3,** 331-5).—This Japanese beetle is only active in light and at a temperature above 23° C. The locomotor response to light follows the Weber-Fechner law.—W. M. B.

115. Untersuchungen über einige Extractstoffe von Cryptobranchus japonicus. Zugleich ein Beitrag zur Kenntnis der Kreatininbildung im Tier. I. Reuter (*Zeit. Biol.*, 1920, **72,** 129-40).—Creatine, methyl guanidine, and sarcolactic acid were found and estimated in the extracts of the tissues of *C. japonicus*. Arginine, the mother-substance of the creatine, was not found. Instead of arginine another substance, chemically well characterised, called "Japonin," was found by the author. The arginine is quickly and completely oxidised to creatine in the intermediary metabolism, with simultaneous methylation. This is the case also with warm-blooded animals. The oxidation and changes of the arginine are different in other invertebrates, because the creatine is absent in their intermediary metabolism.—H. W.

116. Ein einfacher Versuch für das physiologische Praktikum. M. A. van Herwerden (*Zntrlbl. f. Physiol.*, 1920, **34,** 413-4).—Daphnia, seen under low magnification, is suitable for demonstrating the effect of drugs, temperature, etc., on the heart-beat. Interesting experiments on the attack and immobilisation of Daphnia by a fresh-water polyp are also outlined.—C. L. E.

117. Morphologische und kausal-analytische Untersuchungen über das Internephridialorgan von Physcosoma lanzarotæ nov. spec. W. Harms (*Archiv f. Entwickl. Mechanik.*, 1921, **47,** 307-74).—Histological and experimental investigations and analysis of the internephridial organ proved it to be a near relation to the interrenal organ of the vertebrates. This is the first demonstration of a similar organ with internal secretion in invertebrates; it corresponds to the suprarenal cortex of vertebrates. Extirpation of the organ produced symptoms similar to those of Addison's disease.—H. W.

118. Molluscan Cœlomic Fluid. J. B. Collip (*J. Biol. Chem.*, 1920, **45,** 23-49).—During exposure to air the CO_2 content, calcium content, and "buffer" value of the cœlomic fluid increase. It is suggested that the CO_2 formed during respiration dissolves calcium carbonate from the shell. This process occurs in the absence of oxygen, and *Mya arenaria* may be a facultative anaerobe.—H. E. R.

119. Time and Intensity in Photosensory Stimulation. S. Hecht (*J. Gen. Physiol.*, 1921, **3,** 367-90).—If the intensity of light alone is varied, the effect on *Mya* is proportional to the logarithm of the intensity. If time of action alone is varied, the effect is directly proportional to the time. When both together are in action the effect is expressed by the product, $E = kt\log. I$. The most effective portion of the spectrum is near 500 $\mu\mu$. The absorption curve of the photosensitive substance is mapped out on the basis of the data obtained.—W. M. B.

120. The Muscle Tension Theory of Heliotropism. W. E. Garrey (*Proc. Nat. Acad. Sci.*, 1917, **3**, 602-9).—From experiments in which illumination of one eye, blackening one eye in whole or in part, or of both eyes in whole or in part, etc. (in insects), the conclusion is drawn that the motions of these animals to or from a source of light are due to an influence of the light on the tension of the muscles of different sides of the body whereby the animal is automatically carried to or from the source of the light.—W. D. H.

121. Problems of Adaptation. I. The Reformation of the Mantle Glands of Chromodoris. W. J. Crozier (*Biol. Bull.*, 1920, **39**, No. 2).—The regular arrangement of the repugnatorial glands upon the ventral surface of the caudal veil of *C. zebra* is disturbed by regenerative changes subsequent to natural injury in such a way that there are formed more glands than would normally be exhibited. It is shown that the several aspects of this phenomenon can be accounted for on the assumption of a constant flow of a definite amount of prosecretory materials to the gland-bearing region.—W. D. H. (*W. I.*).

122. Problems of Adaptation. II. Reproduction in Coscinasterias tenuispina. W. J. Crozier (*Biol. Bull.*, 1920, **39**, No. 2).—*C. tenuispina* reproduces gametically during a brief interval in January and February; at this time very few individuals show signs of recent autotomous division. With the gradual warming of the sea, self-division is evidenced with increasing prevalence. The plane of division passes between two madrepores (or groups of madrepores). In this sea-star a large ray near a madrepore is the effective anterior in creeping. There are indications of the development of two such "anterior points," associated with respective madrepores, previous to division. The adaptive aspects of this situation are discussed.—W. D. H. (*W. I.*).

123. Problems of Adaptation. III. The Cloacal Pumping of Holothurians (Stichopus). W. J. Crozier (*Biol. Bull.*, 1920, **39**, No. 2).—*S. mœbii* pumps water into its respiratory trees at the rate of probably not more than 20 to 21 litres in each 24 hours. This volume is relatively much less than the volume of the water current produced by sponges or ascidians. It is pointed out that in Stichopus respiratory and excretory needs merely are served by the water current, food-getting being accomplished in another way.—W. D. H. (*W. I.*).

124. Fertilisation—VIII. and IX. F. R. Lillie (*Biol. Bull.*, 1921, **40**, No. 1).—VIII. This is a comparison of specificity in cross fertilisation of *Strongylocentrotus purpuratus* and *S. franciscanus*. Various sperm concentrations were used. The ease of straight fertilisation is several hundred times greater than cross fertilisation. Agglutination phenomena are strikingly specific, and are regarded as the main factor in specificity of fertilisation. IX. The statement of J. Loeb that eggs of *S. purpuratus* which have formed membranes as a result of butyric acid treatment can be fertilised by sperm if the membranes are destroyed by shaking raises a difficult question in the problem of fertilisation. The membrane-forming reaction by butyric acid is apparently the same as by fertilisation, but in the latter case refertilisation is impossible. The studies of the writer showed that capacity for fertilisation after butyric acid treatment of the unfertilised eggs persists only if the membrane-forming reaction induced by the butyric acid is incomplete; in general the success of superimposed insemination is inversely proportional to the success of the butyric acid treatment, and the superposition tends to reach a vanishing point. These results confirm those of Moore on Arbacia and of Just on Echinarachnius.—W. D. H. (*W. I.*).

CELLS AND TISSUES

125. La méthode de la radiopiqûre microscopique; un moyen d'analyse en cytologie expérimentale. S. Tchahotine (*Compt. rend.*, 1920, **171,** 1237-40).—A method is described for directing a small beam of ultra-violet rays of w.l. 280 $\mu\mu$ on any desired part of a cell. Experiments have been carried out successfully on the eggs of the sea-urchin. In one of these, in the two blastomeres stage, the nucleus of one cell was destroyed and its further development arrested, while the unharmed cell divided normally.—J. A. M.

126. Effects of Anæsthetics on Protoplasm. L. V. Heilbrunn (*Biol. Bull.*, 1920, **39,** 307-15).—Great divergence of opinion exists regarding the effect of anæsthetics on the physical properties of living protoplasm. Some have considered they act by lowering oxidation, or affecting the permeability of the plasma membrane. Others, again, think they alter the viscosity of the living substance, and the present paper supports this view. Previous workers on this aspect of the subject differ, some claiming that viscosity falls, others that it rises. The object here investigated was the sea-urchin egg, the division processes in which stop when anæsthesia is established. The concentration necessary for this purpose was determined for 14 anæsthetics of the fat-solvent type, and found to vary between 0·13% (chloroform) to 5% (acetone) in sea-water. The lethal concentration was higher in each case. The anæsthetic concentration in all these cases produced lowering of viscosity, so that when the eggs were centrifuged all the granules fell to one end of the egg. Normal eggs remained evenly opaque. But with increase of concentration toward the lethal dose, gelation or coagulation occurred—*i.e.*, viscosity was irreversibly increased. Various degrees of cold, or of hypotonic sea-water produced corresponding anæsthetic and viscosity effects. On the other hand, certain anæsthetics of another type—$MgSO_4$, hypertonic sea-water, and KCN—increased viscosity at the anæsthetic concentration. But in both types the end result is the same. A too fluid or too thick condition of the protoplasm hinders its normal activities and *inter alia* inhibits mitosis. Experiments on irritability of Hydra gave corroborative data.—W. D. H.

127. Sur la résistance électrique des cellules et des tissus. M. Philippson (*Réunion soc. belge biologie*, 6 novembre, 1920, 1399-1402).—Avec des courants alternatifs de mesure de haute fréquence, réalisés par une technique spéciale, l'auteur constate que la résistance spécifique (cube de tissu d'un centimètre de côté) des tissus vivants est très élevée pour la fréquence 1000 à la seconde, mais que cette résistance diminue plus ou moins rapidement à mesure que la fréquence augmente, pour se rapprocher d'une valeur minima ou résistance limite qui représente la résistance propre de la substance cellulaire et peut donc donner la mesure de l'association des sels et des substances organiques dans les cellules vivantes. Cette résistance spécifique des tissus est en général la même que celle d'une solution de chlorure sodique dont la concentration moléculaire est plus faible de moitié que la concentration moléculaire de l'extrait de l'organe. L'auteur en conclut que la moitié des sels de l'extrait sont liés aux molécules organiques dans la cellule.—L. F.

128. Structure of Chromosomes. A. B. Lee (*Quart. J. Micr. Sci.*, 1920, **65,** 1-32).—Many nuclei in different animals are dealt with. The title is given for those interested in cytology.—W. D. H.

129. Synapsis. III. Nuclear Organisation of Germ Cells in Libellula depressa. L. Hogben (*Proc. Roy. Soc.*, 1921, **92B,** 60-80).—Title given for cytologists interested in this subject.—W. D. H.

130. Geschlechtchromosomen. Untersuchungen an Psychiden. I. Experimentelle Beeinflussung der geschlechtbestimmenden Reifeteilung bei Talæporia tubulosa Retz. J. Sailer (*Arch. f. Zellforsch.*, 1920, **15,** 249-67).—The proportion between the male sex

and the female sex can be changed by the effect of warmth and over-ripeness in the direction of the male sex and by the effect of cold in the direction of the female sex. A theoretical explanation is attempted.—H. W.

131. Kleine Beobachtungen und Ideen zur Zellenlehre. II. Die Spermatogenese eines parthenogenetischen Frosches nebst Bemerkungen zur Frage, welches Geschlchte bei den Amphibien das heterozygotische ist. R. Goldschmidt (*Arch. f. Zellforsch.*, 1920, **15,** 283-90).—The genetic and cytological facts make it plausible that the female sex is the heterozygotic sex in frogs.—H. W.

132. Nature of Nuclear Activity. D. H. Tennent (*Proc. Nat. Acad. Sci.*, 1920, **6,** 217-21).—The basophil bodies, which occur in the cytoplasm during certain stages of cell division, are not chromidia, but are the result of indirect nuclear activity. It is suggested that suspensoid particles, which are surrounded by emulsoid particles, coalesce as a result of dehydration produced by an enzyme, which is emitted by the nucleus and passes into the cytoplasm. This change is reversible, and the basophilic particles again pass into solution at a later stage of cell division.—W. D. H. (*Chem. Abstr.*).

133. Function of the Nucleolus. J. B. Gatenby (*Sci. Progress*, 1921, **15,** 480-2).—In the short space of 3 pages the author cannot do justice to his contention that the nucleolus is an important and independent cell organ. For this reason the arguments are not quite convincing. But from numerous examples and observations in different parts of the animal kingdom the view advocated is briefly that the nucleolus has an importance equal to that of the chromosomes. It may produce protein bodies, forming the egg-yolk; it may lead to fat formation and the formation of secondary nuclei—*e.g.*, in ants' eggs independently of the chromosomes.—W. D. H.

134. The Chemotactic Effect of Osmosis upon Leucocytes. F. Maltaner and Ella Hoppe (*J. of Hygiene*, 1921, **19,** 309-19).—Experiments are described which show that the movement of leucocytes depends upon osmotic force; leucocytes move from a less dense to a denser solution.—W. E. G.

135. Biology of the Lymphocytes. S. Bergel (*Z. exp. Path. Ther.*, 1920, **21,** 216-27).—Almond oil, neat's-foot oil, emulsified lecithin, and 10% lecithin in oil solution were injected into the abdominal cavity and other places. Since the emigration of the cells was almost entirely lymphocytic, while within the contiguous bloodvessels many polymorpho-nuclear granular leucocytes were evident which had not emigrated, the conclusion is reached that this is the first demonstration that has definitely and conclusively proved the chemotaxic elective action of injected substances on the lymphocytic elements of the blood.—W. D. H. (*Chem. Abstr.*).

136. Effect of Potassium Permanganate on the Mesenchyme Cells of Tissue Cultures. W. H. Lewis (*Amer. J. Anat.*, 1921, **28,** No. 3).—Potassium permanganate produced changes in these cells, their rapidity depending upon the strength of the solution. With a 1 to 40,000 or a 1 to 80,000 solution the changes were slow enough to be followed, and death of the cells occurred in about one-half hour. The nucleus was first affected, and in a few minutes showed coagulation changes, followed by a contraction of the chromatin into a dense mass and the expulsion of the nuclear sap in the form of clear vacuoles. Shortly after the mitochondrial threads broke up into rods and granules. They became more fluid and swollen, and since they are supposed to consist largely of phosphatides, this indicated that oxidation had occurred, as phosphatides when oxidised take up water. The loss of colour reactions indicated cell death. The centrosphere did not seem to be affected.—W. D. H. (*W. I.*).

137. Sur une réaction microchimique de la cellule épithéliale pulmonaire. E. Jauré-Fremet, J. Dragoïn, and Mlle. du Vivier de Streel (*Bull. soc. chim. biol.*, 1920, **2,** 166-70).—The reagent contains formaldehyde and cadmium chloride, and appears to give a yellow precipitate with certain sulphur compounds in lung tissue.—J. C. D.

138. Über das Erwachen eigenes Tätigkeit in functionell abhängigen Organen nach der Lösung ihres physiologischen Zusammenhanges mit den übergeordneten Zentren. F. B. Hofmann (*Zeit. Biol.*, 1920, **72,** 256-72).—The following cases are considered: The "ciliated plates" of some medusæ, the spinal centres of vertebrates, striped muscle ("spontaneous" contractions in paralysed muscles of toads), the salivary glands, etc. These phenomena of automatism or spontaneous peripheral "tonus" are explained in the following way: the irritability of such isolated organs increases, so that internal excitations can now cause an effect. In some organs the excitability towards external stimuli is also higher.—H. W.

139. Physiological Significance of Protamines and Histones. A. Clementi (*Atti. R. Accad. Lincei*, 1920, [v.], **29,** ii., 298-301).—The conclusion is drawn that these materials exert not only a static function in virtue of their basic character, but also a dynamic one related to their chemical constitution. The latter appears to act as an immediate reserve for the genesis of the purine and pyrimidine bases necessary for the synthesis of fresh nucleic acid as cells multiply, or for its rebuilding after catabolism.—W. D. H. (*J. C. Soc.*).

140. Keratitis bei aleukocytären Tieren, ergänzende Bemerkungen zu der in Bd. 19, H. 2, dieser Zeitschrift erschienenen Arbeit von Brückner und Lippmann. E. Hannemann (*Zeit. f. exp. Path. u. Therap.*, 1920, **21,** 28-36).—A description of the results of experiments in which various tissues—cornea, valve of heart—were cultivated in plasma; wandering polynuclear cells are shown to be produced in the absence of any possible contamination with leucocytes.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

141. Algunas observaciones sobre la histogénesis de la neuroglia en el bulbo olfativo. F. de Castro (*Arch. de neurobiol.* (Spanish), 1920, **1,** 49-72).—Investigations on the olfactory bulb of new-born and older cats and dogs show that glia cells are derived from the epithelial cells of the primitive medullary tube. These become modified in shape in accordance with the characters of the surrounding cells.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

142. Rapport des neurites avec les tissus dans la cornée. J. Nageotte (*Compt. rend.*, 1921, **172,** 94-6).—The nerve fibres in the corneal substance are surrounded by a neuroglial sheath, while the fibrils distributed in the anterior epithelial layer are free from any such covering. The author maintains that this is a general law; nerve fibres passing through mesodermic tissue are protected from contact with such tissue, and only become free in tissue of ectodermal origin.—J. A. M.

143. Sur la transformation néoplastique des fibres musculaires striées avec métastases viscérales dans l'évolution du sarcome expérimental des oiseaux. A. Paine and A. Peyron (*Compt. rend.*, 1921, **172,** 101-3).—A tumour produced by inoculation into the pectoralis major consisted of cells resembling embryonic muscle fibres. Metastatic growths in the liver and lungs showed the same type of cell.—J. A. M.

144. Über die Beziehungen der Pigmentzellen im Corium und in der Epidermis bei Anuren. W. Kornfeld (*Verhandl. d. zool.-bot. Gesellsch.*, 1919, **69,** 158-60).—During the later larval stages of *Rana temporaria* there is a limited period of time during which cells wander from the corium to the epidermis. In the epidermis of the dorsal surface of *Bombinator pach.* there are a few isolated pigment cells only, but large melanophores of the corium send pigmented ramifications between the epidermal cells, while the main nucleated cell body remains in the deeper layers. It is suggested that the differences in the motility of these two types of pigment cells are produced by similar physicochemical factors to those which determine the movements of amœbæ and Euglyphæ respectively.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

145. The Connective Tissue Ground Substance in Living Amphibian Embryos. G. A. Baitsell (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 207-8).—These observations on the ground substance in living amphibian embryos confirm those previously obtained with

prepared material, and show that the primary substance in connective tissue formation is a secreted intercellular material.—D. H. de S.

146. The Silver Reduction Method for the Demonstration of Connective Tissue Fibres. J. R. Perdrau (*J. of Path. and Bact.*, 1921, **24,** 117).—Sections are treated by Pal's decolourising method before silvering, as in Da Fano's modification of Bielschowsky's method. Isolated white and elastic fibres are stained an intense black.—W. E. G.

147. Über Kalkbindung durch tierische Gewebe. E. Freudenberg and P. György (*Biochem. Zeit.*, 1920, **110,** 299-305).—Cartilage takes up (combines with) calcium; so do other tissues. The combination or adsorption, or whatever it is, is said to be a function of the H-ion concentration, which is what one would expect.—E. C. G.

148. Function of Osteoclasts. H. E. Jordan (*Anat. Rec.*, 1921, **20,** No. 3). —Histological evidence is presented of an osteolytic function on the part of the large multinucleated giant cells of the mandibular marrow of the new-born cat. These giant cells contain large globules of absorbed osseous material, and are genuine osteoclasts. The enamel pulp contains similar giant cells with similar globules. The latter globules are interpreted as absorbed superfluous enamel and the giant cells as ameloclasts.—W. D. H. (*W. I.*).

149. Experimental Studies on Heteroplastic Bone Formation. G. Asami and W. Dock (*J. Exp. Med.*, 1920, **32,** 745-66).—The bone formation following ligature of the renal vessels, or transplantation of fresh or boiled pinna or xiphoid cartilage to subcutaneous tissue, was studied. Osteogenesis in the kidney with ligatured vessels takes place through the activity of young fibroblasts, and subsequently by direct ossification of hyaline connective tissue in continuity with preformed bone, and through erosion of lime plaques by granulating tissue and laying down of lamellar bone by cells derived from fibroblasts. It is thus a membrane bone formation. The changes commence in the loose vascular connective tissue of the calyx. With autotransplanted ear cartilage there is active new formation of cartilage and of bone in the perichondrium; the bone subsequently invades the calcified new cartilage. This type is thus endochondral. Xiphoid cartilage was not ossified.—C. L. E.

MUSCLE

150. Zur Analyse der myotonischen Bewegungsstörung. Nebst Bemerkungen über die Tonusfunction des Skelettmuskels. H. Schäffer (*Deutsche Zeitsch. f. Nervenheilk.*, 1920, **67,** 224-43).—The reflex theories of Gregor and Schilder cannot be confirmed. The author proves that the myotonic disturbances of movements have their cause only in the muscle itself, and are independent of any influence of central innervation. The author therefore sees the essence of the myotonia as an irritable infirmity of the sarcoplasm. He proves that the sarcoplasm theory of Pässler in the form he himself had amplified is sufficient to explain the anomalies of the myotonic muscle.—H. W.

151. Der physikalisch-chemische Mechanismus der Muskelkontraktion. E. Herzfeld and R. Klinger (*Naturwissenschaften*, 1920, **8,** 359-63).—The action current of the nerve decomposes the hexose phosphates, and the lactic acid so liberated is absorbed by the proteins of the muscle fibrillæ, and so produces the contraction. The oxidative removal of the lactic acid brings the muscle into the resting condition once more.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

152. Le myogramme du réflexe rotulien. Composantes clonique et tonique. F. Bremer (*Réunion soc. belge biologie*, 4 décembre, 1920, 1564-9).—L'auteur se rallie à l'hypothèse de Sherrington, Langelaan et Piéron, relative à la dualité clonico-tonique des réflexes tendineux et admet le rôle du cervelet dans la genèse de la phase tonique. —L. F.

153. L'action physiologique des acides et leur solubilité dans les lipoïdes. M. Philippson et Mdlle. G. Hannevart (*Réunion soc. belge biologie*, 4 décembre, 1920, 1570-2).—Une circulation artificielle d'acides forts, inorganiques, en solution centième normal dans le liquide de Locke, ne détermine pas la fatigue du muscle strié de la grenouille; les acides organiques au contraire, en solution de même concentration, produisent l'épuisement musculaire avec une rapidité croissante suivant la série formique-glycérique-lactique-acétique-tartrique-propionique-malique-butyrique. En imprégnant des sacs de collodion avec de l'extrait éthéré de chair musculaire on obtient des filtres très peu perméables aux acides inorganiques, très perméables aux acides organiques dans la série croissante formique-lactique-acétique-butyrique.—L. F.

154. Zur Physiologie der Muskelbewegung. H. H. Meyer (*Med. Klinik*, 1920, No. **50,** 1282-3).—If special nerves bring about the "tonic shortening" of striped muscle, the author considers that it is very doubtful if these nerves are sympathetic or parasympathetic. It is possible that the "tonus system" is a separate system without cell stations in peripheral ganglion cells.—H. W.

155. Superposition der Zuckungen und Tetanus am Froschherzen dürch Abkühlung. E. Frey (*Arch. exp. Path. Pharm.*, 1920, **87,** 201-5).—The observation is explained by the higher excitability of the vagus nerves in consequence of the cooling.—H. W.

156. Zur Theorie der intracentralen Hemmungen. E. Brücke (*Wiener klin. Woch.*, 1921, **34,** 21).—On stimulation of the 8th or 9th dorsal spinal roots of the frog by the faradic current, there is a reflex contraction of the homolateral gastrocnemius, most marked for the 9th root. Simultaneous faradisation of both roots leads to relaxation of the muscle—*i.e.*, to inhibition of the reflex. But if both roots are stimulated by tuning-forks of frequencies 50 and 51 respectively, there is a tetanus which waxes and wanes with the beats of the combination—*i.e.*, once a second. This lends support to Verworn's theory of interference inhibition, since, when the beat is at its loudest, the stimuli are synchronous, and this is when the tetanus is strongest.—H. W. (trans. C. L. E.).

157. Muscle Tonus, Tonic Rigidity, and Tonic Fits. Sir J. P. Stewart (*Brit. Med. J.*, 1921, i., 217-9).—A fairly complete reproduction of acute decerebrate rigidity from unopposed activity of the subcortical motor centres may occur in human patients in rare cases. Such a case is described. At the autopsy the left lateral ventricle was distended with a large blood-clot, and the left corpus striatum was ploughed up by hæmorrhage. Decerebrate rigidity in man is the result of a destructive lesion, usually a hæmorrhage, in the mid-brain. Acute decerebrate rigidity is usually a terminal phenomenon in a dying patient, but a case is described in which this was not so. Rigidity may occur in pyramidal lesions—*e.g.*, in chronic hemiplegia—or in extra-pyramidal lesions—*e.g.*, in paralysis agitans; in the former case the action of the subcortical centres, in the latter that of the pyramidal tract centres, is unrestrained. Occasionally, rigidity may occur in man from irritative cerebellar lesions, producing a variety of "tonic fits." A case of this kind is described.—D. H. de S.

158. Rigor Mortis in Smooth Muscle and a Chemical Analysis of Fibromyoma Tissue. E. F. Hirsch (*J. Biol. Chem.*, 1921, **45,** 297-306).—Records of the shortening of portion of uteri and of fibromyomatous tissue following operative removal show that rigor mortis occurs except in those tumours that have undergone degeneration. The rigor mortis is accompanied by acidity, diminution of reducing carbohydrates, and a decrease in alkali reserve.—H. E. R.

159. Motility in the Animal Organism. E. H. P. Ward (*Med. Rec.*, 1920, **97,** 47-58).—All forms of movement in animals are to be explained, not in terms of contraction, but as resulting from expansion produced by the gaseous (!) CO_2 liberated during tissue metabolism.—T. R. P.

NERVE. REFLEX ACTION

160. Über die Umbahnung nervöser Impulse. H. Bickel (*Münch. med. Woch.*, 1920, **67**, 775-7).—Manifestations of nerve stimulation can occur both as a result of direct stimulation of the nerves involved, and also as a secondary result of paralysis in other nerves. In the latter case the paralysis leads to a diversion of the excitation waves. The mechanism of diversion explains both many phenomena in the subcortical region (accompanying movements of certain sorts, reflex anomalies) and various results of psychical excitation, which occur through infective, toxic, or mechanical damage to the brain.—J. H. B.

161. Peripheral Nerve Injuries. By a Committee (E. F. Buzzard, Chairman) (*Med. Res. Council*, 1920, Special Report Series, No. 54, pp. 59).—The report is divided into four parts, the first of which is concerned with nerve injuries in general, and the second with injuries of special nerves; in these 2 parts are described methods of examination, diagnosis, treatment, and signs of returning function. The third part contains a description of the histological changes in the nerves. In the process of regeneration, the new fibres seem to grow from the central portion of the nerves to the separated distal portion; the question as to how far the distal end exercises any attractive influence is left unsettled. The fourth part deals with the subject of pain with injuries of peripheral nerves. The absence of pain in the majority of cases is a striking feature. The report contains many useful illustrations.—D. H. de S.

162. The Significance of the Calcium Ion in the Cell; Experimental Tetany. J. B. Collip (*Canad. Med. Ass. J.*, 1920, reprint, pp. 3).—Distilled water, sodium bicarbonate, sodium and potassium chlorides, and other electrolytes, cause tetany when injected into the spinal canal of rabbits and dogs. The tetany so produced is antagonised by intrathecal injection of $CaCl_2$. The inference drawn is that a decrease in the relative concentration of the Ca-ion in the motor nerve cell acts as a stimulus, and a tetanic seizure results.—D. H. de S.

163. Reflex Times in the South African Clawed Frog. W. A. Jolly (*Proc. Roy. Soc.*, 1921, **92B**, 31-50).—The reflex times were measured at temperatures ranging from 14° to 30° C. The average heteronymous time is 18·7 σ (0·0187 second). The average homonymous is 14·9 σ. That is to say, the crossed reflex time is longer than the same side reflex time by 3·8 σ. The experiments can be divided into two classes, the chief determining factor being the general condition or "fitness" of the spinal preparation. In the first class, where the preparation is normal and the temperature fairly high, the average heteronymous time is 15·7 σ and the average homonymous 14·3 σ. Since the difference between the crossed and same side reflex times is here very brief—viz., 1·4 σ—and as in some experiments the crossed reflex time is the shorter, it is concluded that the intraspinal paths of the two reflexes are similarly constituted as regards number of synapses; that is to say, each path normally involves one synapse. In the second class, where the frog is not in the best condition, either on account of a recent operation or from long survival since operation, the short path is not open for the crossed reflex, and a longer path containing two additional synapses, or three synapses in all, is employed. The average heteronymous time is here 23·7 σ, and the average homonymous 15·7 σ, giving an excess delay for the crossed reflex of 8 σ. The delay at a synapse in the spinal cord is found to be about 3·7 σ. This is considered to be referable to a single synapse, but it is not intended to exclude the possibility that it represents the delay at a set of synapses.—W. D. H.

164. Zur Kenntniss des Patellarreflexes, zugleich über eine neue Methode der Reflexverstärkung. E. Popper (*Deutsche Zeitsch. f. Nervenheilk.*, 1920, **67**, 131-40).—

Coughing strengthens the patellar reflex. The author explains the phenomenon by a removal of tonus.—H. W.

165. The Babinski Reflex. F. M. R. Walshe (*Med. Sci.*, 1921, **3,** 437-44).—An interesting summary of the history, importance, and meaning of the extensor plantar response.—W. D. H.

166. Myogram of the Flexor Reflex evoked by a Single Break Shock. K. Sassa and C. S. Sherrington (*Proc. Roy. Soc.*, 1921, **92B,** 108-17).—In the spinal preparation a single break shock considerably above threshold value, applied either to a bared afferent nerve or to local skin, evokes a reflex contraction stronger and more prolonged than the maximal twitch evoked from the motor nerve itself; this is so whether or no the muscle retains its own intrinsic proprioceptive arc. Summation of successive contraction waves is present in the reflex contraction. In other words, repetitive discharge from the reflex centre occurs in response to a single induction shock stimulus applied to an afferent nerve or to local skin connected with that centre.—J. A. H.

167. Über Dauerverkürzung der quergestreiften Warmblütermuskeln. A. Fröhlich and H. H. Meyer (*Arch. exp. Path. Pharm.*, 1920, **87,** 173-88).—Muscular contracture in the clasp reflex of the frog, and in catalepsy (ape and man), in the infective disease tetanus, and in certain invertebrates (mussels) is a form of contraction in which there is no evidence of internal or external work. Certainly action currents are absent. They are occasionally present in human catalepsy, and are then very slight.—H. W.

CENTRAL NERVOUS SYSTEM

168. The Origin of the Cerebral Hemispheres. C. J. Herrick (*J. Comp. Neurol.*, 1921, **32,** No. 4).—Assuming that the telencephalon of vertebrate ancestors was the most rostral portion of a neural tube whose walls were uncomplicated by local thickenings or evaginations, it is evident that in different groups of fishes differentiation has followed divergent lines. In some ganoids (Acipenser, Amia) and in all teleosts a portion of the lateral wall of the telencephalon adjacent to the lamina terminalis has evaginated to form the olfactory bulb, and the remainder of the telencephalon is variously thickened without evagination. The evaginated portions only are the true cerebral hemispheres, and the remainder may be termed the telencephalon medium or primitive endbrain. In all vertebrates these two subdivisions of the telencephalon can be recognised, and as we pass from lower to higher forms a progressively larger proportion of the primitive endbrain is joined to the olfactory bulbs in the evaginated hemispheres. Some very generalised fishes have, however, extensively evaginated thin-walled cerebral hemispheres instead of massive local thickenings in the primitive endbrain, and this thin-walled form may have been better adapted to oxygenate the brain among the primitive mud-fishes which inhabited the drying lakes and streams in the period of increasing aridity of late Silurian geological time, and from which the Amphibia arose. After the acquisition of efficient pulmonary respiration in the Amphibia, the evaginated cerebral hemispheres, now well supplied with oxygenated blood, differentiated progressively along lines impossible to animals whose forebrain patterns had been stabilised on the teleostean plan.—W. D. H. (*W. I.*).

169. Contribution à l'étude du métabolisme cérébral par la méthode des circulations partielles, 2e partie. H. Renauld-Capart (*Arch. intern. physiol.*, 1920, **15,** 411-45).—L'auteur a montré que lorsqu'on limite chez le chien la circulation au thorax et à la tête, l'activité cérébrale est rapidement compromisé. C'est la suppression de la fonction hépatique qui produit la paralysie cérébrale. Le foie semble former par sécrétion interne une hormone ou un enzyme indispensable à la vie des neurones cérébraux.

Cette substance hépatique est active à très petite dose. Ainsi une très minime quantité de sang ordinaire c. à d. ayant traversé le foie, injectée à un chien à circulation réduite au thorax et à la tête, suffit pour restaurer, au moins temporairement, les fonctions cérébrales suspendues par exclusion du foie. Mais le foie ne posséde pas d'action de désintoxication proprement dite vis à vis des toxines élaborées par les centres nerveux en activité.—L. T.

170. Functional Significance of Basal Arteries of Forebrain. J. L. Shellshear (*J. Anat.*, 1920, **55,** 27-35).—One realises on reading this paper how exact anatomical knowledge may aid the physiological worker. The author refers to Stopford's work (*ibid.*, 1916, **50**), in which it was shown that the hypoglossal nucleus, the trigonum vagi, and the trigeminal nucleus are supplied with blood exclusively by the anterior spinal, vertebral and post. inf. cerebellar arteries. Of similar type is Beevor's work on the thalamus, and of the work on the c. striatum, etc., in the present paper. He suggests that functions can be determined by shutting off the blood-supply to known areas. Arteries appear to be laid down with a definite relation to function; arteries once laid down maintain their anatomical and presumably functional integrity throughout phylogeny—*e.g.*, the original reptilian type of blood-supply to the claustrum is preserved throughout the mammals.—W. D. H.

171. Zur Kenntnis der pathologischen Veränderungen des Striatum und des Pallidum und zur Pathophysiologie der dabei auftretenden Krankheits-ercheinungen. C. u. O. Vogt (*Zeitsch. f. d. ges. Mem. u. Psychiat.*, 1920, **21,** 330).—An elaboration of previous work. The paper is in 5 sections. (1) The essential anatomical details of the primitive motor mechanism of the nervous system are discussed. (2) Eight syndromes of the corpus striatum and their corresponding pathological bases are described. (3) In this section the symptoms are discussed singly. (4) The physiological significance of these symptoms is analysed. It is concluded that the c. striatum stands to the pallidum in the same relation as the cerebral motor cortex does to the motor nuclei of the tegmentum and brain stem. (5) The general functions of the c. striatum and pallidum are discussed; they are centres for "primary automatisms." In the first month of life the c. pallidum controls these; later the c. striatum exercises a controlling and restraining action and becomes the centre for all expressional and emotional movement complexes, for automatic associated movements, and for defensive reflexes.—J. A. H. (*Med. Sci.*).

172. Brain Stem. IV. On the Relation of the Cerebral Hemispheres and Thalamus to Arterial Pressure. F. T. Rogers (*Amer. J. Physiol.*, 1920, **54,** 355-74).—Vaso-motor reflexes can readily be obtained from spinal nerves in pigeons. Starvation for 3 to 4 days has little effect on the blood-pressure. Removal of the cerebral hemispheres leads to an average fall of blood-pressure of 17%. The original level was not regained. Removal of the thalamus leads to fall of temperature, which is not primarily due to lowered blood-pressure. In this state, the vaso-motor reflexes are depressed in proportion to the fall of temperature. Removal of a single hemisphere does not appreciably change the arterial pressure. It is suggested that the higher centres exert a continuous stimulating action on the vaso-motor centres of the lower level. The effect is not from any particular region, but in proportion to the amount of brain substance removed.—W. M. B.

173. Sobre las funciones del cuerpo calloso. G. R. Lafora and M. Prados (Congress at Bilbao of the Spanish Assoc. for the Advancement of Science, 1919, Section VII. A [Medical], 171-5).—Earlier investigators had failed to observe definite symptoms following longitudinal division of the corpus callosum, unless the hemisphere was injured, when motor abnormalities and apraxia of the opposite side appeared. The authors used monkeys and cats, and kept them in cages so arranged that, to obtain their food,

they had to pull with the left hand on a ring, which, by means of a pulley contrivance, raised the door of a box. The operation was not performed till this manœuvre had been learnt. In every case longitudinal section of the corpus callosum was followed by hemiparesia and apraxia on the side opposite to that on which the section was made. The authors attribute this to an inhibition of the motor centres of the hemisphere nearer the lesion. In one monkey the corpus callosum was first divided to the right of the middle line, causing a left-sided apraxia, and, after complete recovery, again to the left of the middle line, causing a predominantly right-sided apraxia. The fact that in man lesions or tumours of the corpus callosum are associated particularly with *left*-sided apraxia is attributed to right-handedness, and the consequent greater resistance to inhibition of motor centres in the left hemisphere.—H. H. D.

174. Sobre las celulas polimorfas de la fascia dentata del mono. M. P. y Such (*Archivos de Neurobiologia*, 1920, **1,** 5-11).—The author has studied the polymorphous cells of the fascia dentata of the adult monkey (*Macacus sylvanus*), using the impregnation methods of Bielchowsky and Del Rio Hortega, the available material having been long in formaldehyde. The type of the dendrite formation, for details of which the original must be consulted, is intermediate between that observed in the corresponding cells of the dog and of the horse. The view of Levi, that hyperplasia of the dendrites is associated with large size of the individual, and represents a neuronal expansion corresponding with the somatic evolution, and not a pathological change due to senility, is discussed.—H. H. D.

175. Das Gehirn eines Wunderkindes (des Pianisten Goswin Sökeland). Ein Beitrag zur Lokalisation des musikalischen Talentes im Gehirn. R. Klose (*Monatsschr. f. Psychiatr. u. Neurol.*, 1920, **48,** 63-102).—The brain was of mixed eury-steno-gyrencephalic type, the parts connected with musical performance (posterior $\frac{2}{3}$ of g. temp. sup.) being especially developed. The middle third of the precentral convolution (arm-hand-finger) was also very well developed on both sides, as also were the supramarginal, middle temporal, and angular gyri, and the frontal lobes. There is also a comparison with the brains of 6 other musicians which have been described in the literature.— C. L. E. (*Ber. ü. d. ges. Physiol.*).

176. Unilateralità ed omolateralità dell' innervazione sudorale spinale. G. A. Pari (*Folia med.*, 1920, **6,** 385-94).—Experiments on cats showed that operative procedures on the cord which produce anidrosis or hyperidrosis produce effects on one side only when the lesion is strictly unilateral. Cerebral or medullary stimulation produces on animals successfully operated on a sweating on the intact side only. There is some decussation of the nerve tracts in the medulla.—C. L. E. (*Ber. ü. d. ges. Physiol.*).

SPECIAL SENSE ORGANS

177. Experiments on the Lens in Amblystoma. R. G. Harrison (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 199-200).—Excision of the eye rudiment in the medullary plate stage is followed by suppression of the lens. Likewise, if the optic vesicle is removed immediately or shortly after closure of the medullary folds, the lens fails to develop. If, however, this same lens ectoderm is transplanted to other regions of the head, a well-differentiated lens will develop, provided that the ectoderm is taken from the eye region after closure of the medullary folds. Ectoderm transplanted from other parts of the head or from the trunk to the eye region apparently does not give rise to a normal lens.—D. H. de S.

178. Weitere experimentelle Untersuchungen über die Quelle und den Verlauf der intraokularen Saftströmung. I. Tl. Über den " physiologischen " Pupillenabschluss in

die vitale Ciliarkörperfärbung. E. Seidel (*Arch. f. Ophthalmol.*, 1920, **101,** 383-406).— On injection of neutral-red solution into the anterior chamber of the eye, the resulting colouration of the lens can be shown by suitable methods of illumination not to be confined to the pupillar portion, so that the theory of the physiological closure of the pupil by the lens is untenable. If the dye is injected into the blood-stream, the relative distribution of the colour in the iris and ciliary body gives information as to the physiological permeability of the cells composing these structures.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

179. Über die komplementär gefärbten Nachbilder. A. Juhász (*Zeitsch. f. Psychol. u. Physiol. d. Sinnesorgane; II. Zeitsch f. Sinnesphysiol.*, 1920, **51,** 233-63).—Experiments with prolonged stimuli. The latent period, after which the complementary after-image appears, is within limits independent of the intensity of the original image, though both clearness and durability of after-image increase with the intensity of the original stimulus. Shorter latent periods and greater persistence of complementary after-image result when a pale-coloured object is shown on a black than when on a white background; the converse is true for dark colours. When the period of fixation exceeds a certain threshold value, the complementary after-image appears, after a relatively long latent period, without being preceded by the positive after-image and dark interval. As the fixation period is prolonged beyond this threshold time, the latent period for the after-image diminishes until a constant value of about 12 secs. is reached. The duration of the after-image increases with increase in the period of fixation. When the luminosity of the colourless field (grey-white) on which the complementary after-image is seen is increased, the latent period and persistence of the after-image is reduced, the more so the paler the colours; the converse is true when the field is darkened. The colour of the after-image is affected in the same way by projection on to a white surface as is the corresponding colour sensation by subjective addition of white. In order for a complementary after-image to be recognisable, the coloured surface must exceed a certain size. Latency, clearness, and duration of after-image increase with increasing size of the original image.—H. W. (transl. C. L. E.).

180. Photo-Chemistry of Visual Purple—II. S. Hecht (*J. Gen. Physiol.*, 1921, **3,** 285-90).—The temperature coefficient of the bleaching of visual purple by light is unity over a range of 30° C. This indicates a photo-chemical reaction, not a diffusion process, and that the reaction is not complicated by chemical reactions of the ordinary kind, —W. M. B.

181. Zur Frage der Wirkung von Digitalis auf den Farbensinn. F. Bohnenberger (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11,** 138-43).—The observations of the changes of the colour-sense by small doses of digitalis, which H. Schulz had published, were re-examined. No change of the colour-sense could be detected.—H. W.

182. Photo-Electric Currents in the Eye. C. Sheard (*Physiol. Reviews*, 1920, **1,** 84-111).—A review.—W. D. H.

183. Le seuil de l'audition. Marage (*Compt. rend.*, 1921, **172,** 178-81).—A series of interesting observations on hearing. The author concludes (1) that when the ear is employed as receptor in researches on sound, it is necessary to determine the " auditory coefficient " of each observer; (2) that when powerful vibrations are concerned they should be diminished in intensity, because the hearing apparatus is rendered incapable by such vibrations of appreciating sounds exactly; (3) that shrill notes are better heard than low notes; and (4) that the ear is very sensitive to discordant sounds, which force themselves on the attention.—J. A. M.

184. Sir Thomas Wrightson's Theory of Hearing. E. G. Boring and E. B. Titchener (*Amer. J. Psychol.*, 1920, **31,** 101-13).—Criticises certain points, several of them coming under " mechanics " in Wrightson's treatment of sound-conduction in the internal ear.

Appreciation is given of the Wrightson method and results as to compounding of periodic V-shaped curves, of his invention of the ohmograph, of the kinematic analysis of the middle-ear mechanism, and of the new facts brought forward as to the action of the organ of Corti. "The Helmholtz theory of audition seems to have sunk beyond recovery."—C. S. S.

185. Zur Frage der Geräuschlokalisation. A. Kreidl and S. Gatscher (*Zntrlbl. f. Physiol.*, 1920, **34,** 490-8).—An important factor is the relative acuteness of the two ears, as well as the relation of these to the direction of the sound.—C. L. E.

186. Local Fatigue in Auditory System. J. C. Flügel (*Brit. J. Psychol.*, 1920, **11,** 105-34).—Binaural localisation of a tone is subject to fatigue when one ear has been previously stimulated; the tone then seems displaced away from the fatigued side. During recuperation this apparent displacement fades away. Uniaural stimulation produces another sort of fatigue, shown by lessened intensity of the sensation. This is of brief duration and, unlike the first, is experienced by all persons.—W. D. H.

187. Eine neue Theorie der Kombinationstöne. P. Broemser (*Sitzungsber. d. ges. f. Morphol. u. Physiol. in München*, January 31, 1919, 1920, 67-8).—A mathematical treatment, the chief result of which is to prove that when two series of transverse waves with a common axis of equilibrium interfere at an elastic body itself capable of executing transverse vibrations, there will be produced waves of double the frequency of the original tones, together with their combination tones. In this way subjective combination tones may be produced in the basilar membrane itself by the interference of two sets of waves.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

188. Das anatomische Substrat der Altersschwerhörigkeit. O. Mayer (*Arch. f. Ohren- Nasen. u. Kehlkopfheilk.*, 1919, **105,** 1-13).—Among the many causes (degeneration, etc.) which lead to deafness in old people, special attention is drawn to its commonest cause—viz., rigidity of the basilar membrane. The condition is termed *presbyacusis.* —W. D. H.

189. Physiology of the Otic Labyrinth. A. L. Prince (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 202-3).—Cats were subjected to interrupted horizontal rotation over a prolonged period, and the nystagmus time observed. The duration of post-rotatory nystagmus was found to vary slightly in different animals. The ocular responses to rotation for each animal remained fixed within narrow limits, and were unaffected by prolonged rotation. It is concluded that rotation tests give an adequate index of labyrinthine activity.—D. H. de S.

190. Sur un ensemble de phénomènes de l'ordre expérimental et clinique permettant d'étudier l'état fonctionnel de l'appareil vestibulaire dans ses rapports avec l'équilibration organique. E. Lombard (*Compt. rend.*, 1921, **172,** 132-4).—Some idea of the trend of this paper may be gained from a simplified account of the first paragraph. If the eyes are fixed on an object placed at an angle of 45° with the sagittal plane, and moving with the head, rotation of the head occurs towards the object. If the eyes are then closed, and the arm contralateral to the object is extended at the level of the shoulder, and if the forearm and hand are rapidly pronated and supinated, the arm deviates to the side opposite to the object of the ocular fixation. Those interested must refer to the paper itself for further details.—J. A. M.

191. Über ein Modell zur Demonstration der Stellung der Maculæ acusticæ im Kaninchenschädel. H. Oort (*Pflüger's Arch.*, 1921, **186,** 1-5).—The model consists of a skull mounted on a stand, with an orientated magnified model of the labyrinth on one side and an orientated magnified model of the maculæ on the other.—C. L. E.

192. Über die Funktion der Otolithen. I. Otolithenstand bei den tonischen Labyrinthreflexen. II. Isolierte Otolithen-ausschaltung bei Meerschweinchen. A. de Kleijn and R. Magnus (*Pflüger's Arch.*, 1921, **186,** 6-38, 61-81).—I. The general conclusion is

that the maculæ are sense organs which respond principally to traction; when the otolith hangs horizontal and directly below the macula, so that the latter is pulled upon, the impulses are at a maximum; when the otolith lies horizontal and directly above the macula, so as to exert pressure on it, the effect is at a minimum. The sensory apparatus and the reflex tonus which it engenders appear to be incapable of fatigue. Tonic labyrinth reflexes of extremities, neck, and trunk are released from the utricle, and asymmetric postural reflexes from the saccule; it is uncertain from which part of the labyrinth symmetrical postural reflexes originate. Vertical compensatory eye movements arise from the main saccule otolith, and rotatory movements from the independently innervated angle of the saccule (sinus utricularis ?) In conjunction with former work (Abstract No. 1393, Vol. V., p. 223), the experiments give indications as to the central connections of the various branches of the vestibular nerve. Those for tonic labyrinth reflexes are connected behind the entrance of the 8th nerve, with the centres for the muscles concerned, while those for labyrinthine postural reflexes pass to the posture centres in the mid-brain. The path for the impulses governing vertical compensatory eye movements is to the nucleus of the superior rectus of the same and inferior rectus of the opposite side, while that for the wheel movements is to the nuclei of the inferior oblique and trochlearis. The various reflexes supply good examples of reciprocal innervation. No definite participation of the semicircular canals could be demonstrated. These results apply only to the rabbit, and may need modification for other animals. II. When guinea-pigs are rotated in a centrifugal apparatus at 1,000 revolutions per minute for 1 to 2 minutes, the static (postural tonus) functions of the labyrinth are often lost, while the labyrinthine responses to movement are retained; when this is so, it is found that the otolith membranes have got detached, while the cristæ of the semicircular canals are intact. The common belief as to the static functions of the former and the dynamic functions of the latter in muscular co-ordination is thus supported.—C. L. E.

193. Labyrinthreflexe auf Progressivbewegungen. A. de Kleijn and R. Magnus (*Pflüger's Arch.*, 1921, **186,** 39-60).—Various progressive reflex movements in the guinea-pig, cat, rabbit, and dog, which are connected with particular spatial movements, fail on removal of the labyrinth on both sides, but persist when the afferent nerves of the muscles involved are divided, or when cerebrum or cerebellum are removed; it is concluded that the centres for such movements dependent on the labyrinth are in the brain stem. Destruction of the otoliths by centrifugation (see preceding abstract) leaves the reflexes unaltered; they arise, therefore, from the semicircular canals, as do all reflexes to acceleration, angular or rectilinear, as contrasted with static postural reflexes, which originate in the maculæ.—C. L. E.

194. Tonische Labyrinth- und Halsreflexe auf die Augen. A. de Kleijn (*Pflüger's Arch.*, 1921, **186,** 82-97).—Tonus of the eye muscles depends on the position of the head (*a*) in space (labyrinth reflexes) (see Abstracts Nos. 525, Vol. III., p. 108, and 1393, Vol. V., p. 223), and (*b*) with relation to the neck. The latter reflexes persist after bilateral labyrinth destruction. As a result of both of these reflexes, the eyes tend to maintain a constant position in space, and therefore an unaltered visual field.—C. L. E.

195. Der Schwellenwert des Geschmackreizes bei einigen homologen und isomeren Verbindungen. Y. Renqvist (*Skand. Arch. f. Physiol.*, 1920, **40,** 117-24).—An extension of results previously published (Abstract No. 2886, Vol. V., p. 460) determining the liminal concentration for taste-perception of several homologous series of alcohols and esters. From a formula involving the diffusion coefficient, the adsorption exponent, the serial number of the compound, and the liminal molar concentration for taste, approximately constant values are obtained in homologous series. Solutions of isomeric

compounds at the liminal concentrations for taste perception have approximately equal surface tensions against air.—H. H. D.

196. Sweetness of " Saccharin " and " Dulcin." T. Paul (*Chem. Zeit.*, 1921, **45,** 38).—The sweetness of " saccharin " is increased by the addition of " dulcin," which, by itself, has a lower sweetening property. For instance, a mixture of 280 mg. of " saccharin " and 120 mg. of " dulcin " dissolved in 1 litre of water has the same sweetness as 535 mg. of " saccharin " dissolved in 1 litre of water.—W. D. H. (*J. C. Soc.*).

PSYCHOLOGY

197. Le Réflexe psychogalvanique et sa valeur diagnostique. A. A. Grünbaum. (*Arch. néerl. de physiol.*, 1920, **5,** 1-41).—The author offers an " aperçu critique " of the field indicated by his title. His sketch contains no new facts, and its value as criticism is discounted by the fact that the terms in which it is presented do not indicate any first-hand acquaintance with the " psycho-galvanic reflex," nor any clear appreciation of its physical dimensions. He discusses at considerable length the psychological and physiological factors of the galvanometric deviation, but repeatedly expresses himself as if implying that large and small excursions of the galvanometer signify large and small psychogalvanic changes. He does not make any mention at all of volts or ohms. The author does not regard the sign as possessing any assured diagnostic value; at p. 20 he gives the opinion that " the psycho-galvanometer must not be used for the discovery of simulation." The paper concludes with a very useful bibliography.—A. D. W.

198. Considerations de psychologie comparée. F. J. J. Buytendijk (*Arch. néerl. de physiol.*, 1920, **5,** 42-88).—An extensive series of experiments by approved methods on the monkey, Cercopithecus, which confirm the popular idea that the " intelligence " of the monkey is at a high level. A distinction is drawn between " practical ideas " and " practical judgment " (Hobhouse), and the latter especially is highly developed in the monkey as compared with lower vertebrates. Details of this interesting study are outside the scope of these abstracts.—W. D. H.

199. Fatigue and Retention. J. J. B. Morgan (*J. exp. Psychol.*, 1920, **3,** 319-33).—The author discusses what physical state underlies cerebral fatigue, but with no definite conclusion. He tested the subject on pupils learning the translation of German words, and found that they remembered better what they learnt when they were fresh at the beginning of a lesson than later on when they were tired at the close of a 4-hour sitting. —W. D. H.

200. Smoking and Mental and Motor Efficiency. S. Froeberg (*J. exp. Psychol.*, 1920, **3,** 334-46).—The experiments seem to have been rather severe. The students were made to smoke 5 cent cigars; their previous experience is not mentioned, but as the author says many smoked vigorously for fear the cigar would go out, it looks as if they were not accustomed to tobacco. They were then, after half an hour's smoking, tested over a range of motor and mental functions. Steadiness in the former usually decreased; this coincides with the belief among marksmen. The mental tests showed no marked departure from the normal; some students were unaffected, some a little better, some a little worse.—W. D. H.

201. Ocular Functions and Look-out Service. C. E. Ferree, G. Rand, and D. Buckley (*J. exp. Psychol.*, 1920, **3,** 347-56).—The authors' apparatus is recommended for testing. It is better to make the tests in terms of acuity rather than of the light sense. Many people having excellent light sense have but poor power to discriminate objects at low illumination. The apparatus used was, under Naval advice, one suitable for testing acuity in feeble light.—W. D. H.

202. Block Design Tests. S. C. Kohs (*J. exp. Psychol.*, 1920, **3**, 357-76).—A full description of a test with variously coloured cubes for testing mental efficiency. Results are obtainable independently of the "language factor"—*e.g.*, in the deaf.—W. D. H.

203. Psychological Apparatus. F. L. Wells and C. M. Kelley (*J. exp. Psychol.*, 1920, **3**, 377-89).—The pieces of apparatus described consist of a galvanometer control board, a "choice reaction" switchboard, fall apparatus for chronoscope, a multiple pen chronograph, and a device for water recording of motor tests for estimation of judgment, steadiness, tremor, etc.—W. D. H.

204. Sex Differences in the Effect of Discussion. H. E. Burtt (*J. exp. Psychol.*, 1920, **3**, 390-5).—Münsterberg stated that men profit more by the discussion of a subject than women. In the present experiments students were set to judge a subject's veracity at a mock trial and after open discussion. No sex differences in accuracy of judgment appear to have been found among the Ohio students.—W. D. H.

205. Practice Effects in Intelligence Tests. K. Dunlap and Agnes Snyder (*J. exp. Psychol.*, 1920, **3**, 396-403).—A test known as the Army Alpha test was chosen, and applied to college students on 4 occasions. They improved with practice until the last occasion, when they fell off; the explanation they offered, and which is probably correct, is that by that time they found it a bore.—W. D. H.

206. James' Theory of the Emotions in Relation to the Adrenal Glands. C. E. Kieley (*J. Lab and Clin. Med.*, 1921, **6**, 193-4).—Two cases of "fear" were treated with apocodeine on the assumption that the physical concomitants of fear are produced through psychic stimulation of the adrenal glands, and that apocodeine neutralises adrenaline physiologically. The treatment produced no effect. It is concluded that, if the assumptions are correct, an emotion can be experienced independently of the physical changes which habitually accompany it. This is contrary to the theory of James.—D. H. de S.

207. A Case of Coloured Thinking, with Thought Forms and Linked Sensations. D. F. Harris (*Nature*, 1921, **106**, 725-6).—Examples, with diagrams.—C. L. E.

208. Zur Frage der Exklusivität des Antriebes. J. S. Szymanski (*Zntrlbl. f. Physiol.*, 1920, **34**, 485-90).—Experiments with rats in labyrinths. The conclusion is that the impelling factor is not exclusively limited (*e.g.*, hunger or thirst may incite).—C. L. E.

CEREBRO-SPINAL FLUID

209. Pituitrin-like Substance in Cerebro-spinal Fluid. W. E. Dixon and D. Cow (*Proc. Roy. Soc. Med.*, 1921, **14**, Sect. of Ther. and Pharm., p. 6).—The fluid was collected from a cannula in subcerebellar cisterna (dogs and cats); substances were injected intravenously, and the fluid then was tested on isolated uterus and other organs and on the intact animal. The normal fluid has no action, but injection of extracts of intestinal mucosa or ovary produced in the fluid the appearance of a substance with the properties of pituitrin. Injection of pituitary extract caused this effect immediately, but the other extracts did not do so until after an hour. Extracts of testis, epididymis, liver, pancreas, choroid plexus, etc., histamine, pilocarpine, and adrenaline had no effect.—W. D. H.

210. Reaction of Cerebro-spinal Fluid. C. Shearer and T. R. Parsons (*Quart. J. Med.*, 1921, **14**, 120-4).—If the fluid is carefully collected and prevented from contact with air and escape of CO_2, the acidity is greater than usually supposed. In cerebro-spinal fever it shows distinct acidosis, the P_H may fall to 6·9. The alkali reserve and P_H improve by treatment with alkali and serum. This contrasts with what obtains in other meningeal diseases and is attributed to the ease with which the meningococcus can

attack the glucose of the fluid and change it into lactic acid. (Compare Abstract No. 2691, Vol. V., p. 428.)—W. D. H.

211. A General Colloid Test in Cerebro-spinal Fluid, and the Use of Congo Rubin. H. Lüers (*Kolloid Zeitsch.*, 1920, **27,** 177-82).—A general discussion of the use of gold sols and mastic sols as an aid to diagnosis of certain pathological conditions of the cerebro-spinal fluid. The author suggests that the congo-rubin sol might constitute a valuable reagent for this purpose, since it is in many respects more easily applied than either of the other sols. The method suggested consists in measuring the protecting action of the colloids in the fluid on the colour change brought about by potassium chloride. Three samples of cerebro-spinal fluid were examined. The method consisted in mixing 1 c.c. of 0·1% congo-rubin solution with 1 c.c. of the fluid, adding 7·65 c.c. of distilled water, and 0·35 c.c. of saturated potassium chloride solution, and measuring the time required for the colour change to occur. With normal healthy fluid 41 seconds were required, in a case of locomotor ataxy 66 seconds, and in a case of syphilis 110 seconds.—W. D. H. (*J. C. Soc.*).

212. La circulacion del liquido cefalo-raquideo. G. R. Lafora and M. P. y Such (*Bol. de la Soc. española de Biologia*, 1918, **8,** 51-5).—The authors injected dyes (methylene blue and neutral red) in various ways—by the jugular and the carotid, into the spinal theca, the subcerebellar cisterna, subdurally over the hemispheres, or into the lateral ventricles—and followed its distribution by post-mortem examination.—H. H. D.

213. Alterations of Intracranial Tension by Salt Solutions in the Alimentary Canal. H. Cushing and F. E. B. Foley (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 217-8).—A hypertonic solution of NaCl introduced into the duodenum or rectum of a cat produces a fall of cerebro-spinal fluid pressure comparable to that which occurs when the solution is given intravenously. The change in pressure is roughly proportional to the concentration of the salt and the size of the dose. The changes observed were independent of the blood-pressure, and were not attended by significant alterations of pulse or respiration. In patients with brain tumour and cerebral hernia after operation there was a lowering of tension when hypertonic salt solutions were given by mouth.—D. H. de S.

214. Pacchionian Bodies. W. E. Le G. Clark (*J. Anat.*, 1920, **55,** 40-48).—The author describes fully their distribution and structure. He accepts Weed's view that the cerebro-spinal fluid reaches the venous blood through microscopic arachnoid villi. The Pacchionian body is a hypertrophied or rather distended arachnoid villus, which is herniated into the cavity of the venous sinus by the pressure of cerebro-spinal fluid. Hence, when the pressure rises with age or disease their number increases.—W. D. H.

215. Recherches expérimentales sur la perméabilite des plexus choroides. A. Barbé (*Rev. neur.*, 1920, **1,** 314).—Choroid plexuses removed intact from human brains 4 to 49 hours after death from nervous and non-nervous cases were transfused with tap and distilled water, cerebro-spinal fluid, and serum. Plexuses fixed *in situ* by formalin injection were impermeable to these fluids. It is concluded that the best transudate is serum; transudation is most rapid in plexuses from young persons, those dying from non-nervous diseases, and from fresh specimens; transudation may persist for 24 hours; general paralysis increases, and epilepsy diminishes, the permeability These results are deduced from study of dead tissue.—J. A. H. (*Med. Sci.*).

BLOOD

216. Über die Menge und die Arten der durch die normale Milz gebildeten farblosen Blutzellen. M. v. Melczer (*Arch. f. mikr. Anat.*, 1919, **93,** 307-32).—The spleen forms the basophile leucocytes of the blood throughout life. From the second month to the third year of life it is specially responsible for the formation of lymphocytes and large

mononuclear leucocytes, and thereafter for the formation of neutrophile and eosinophile cells as well.—W. D. H.

217. Action hématopoietique et stimulante de quelques décoctions de rate et de sang. J. W. Howard and F. L. Soler (*La semana méd.*, 1920, No. 43).—L'injection de décoction de rate produit, chez le chien, une augmentation du nombre de lymphocytes et d'érytrocytes.—B. A. H.

218. Über die Blutkörperchen-zerstörende Tätigkeit der Milz. E. Frey (*Deutsch. Arch. f. klin. Med.*, 1920, **133,** 223-36).—The blood of the spleen veins usually contains less blood-corpuscles than the arterial blood (dogs). This difference is increased if the resistance of the erythrocytes is diminished by blood-poisons (ether). The difference decreases to zero if the resistance is raised by other poisons (phenylhydrazine). The spleen is a dense filter for blood-corpuscles of other species.—H. W.

219. Estimation of Erythrocyte and Hæmoglobin Content of Blood. W. F. Harvey (*Indian J. Med. Res.*, 1920, **7,** 479).—The paper is in 3 parts: (1) Estimation of volume of red blood-corpuscles is done by centrifugalisation of whole blood, citrated blood, and by settlement by gravity of citrated blood. (2) Estimation of blood-content by tint and turbidity; 10% formalin in 0·85% sterile salt solution is used to prevent hæmolysis. To preserve tint HCl was alone tried, and was unsatisfactory. (3) Estimation of hæmoglobin. The principle is that of Sahli's hæmoglobinometer.—J. A. H. (*Med. Sci.*).

220. Diurnal Variations in Hæmoglobin. G. Dreyer, H. C. Bazett, and H. F. Pierce (*Lancet*, 1920, ii., 588-91).—The diurnal variations in the Hb of the blood are considerable both in man and animals ; 10% changes are common, but the figure of 30% may be reached. The smallest variations are seen when the amount of Hb is low, and also between 5 and 7 p.m.—W. D. H.

221. Über den Einfluss des Quecksilberquarzlampenlichtes auf die Resistenz der roten Blutkörperchen gegenüber hypotonischen Kochsalzlösungen. K. v. Rohden (*Zeit. f. d. exp. Path. u. Ther.*, 1920, **21,** 409-24).—The diminution of the resistance of the blood-corpuscles by irradiation with sunlight is not the only effect of the ultra-violet rays. Irradiation with ultra-violet rays in therapeutic doses causes in man an increase of the " resistance limit " (difference between minimum and maximum resistance). These changes could not be detected in guinea-pigs.—H. W.

222. Viscosity of Suspensions of Blood-Corpuscles. E. Hatschek (*Kolloid. Zeitsch.*, 1920, **27,** 163-5).—Hess's measurements were recalculated, using his formula for suspended particles that may suffer deformation. The formula is applicable over a wide range of concentrations to blood, and indicates that corpuscles easily lose their shape during blood-flow.—W. D. H.

223. Über die Bindungsgrösse des Chloroforms und Äthylalkohols in den roten Blutkörperchen während der Hämolyse. G. Apitz and M. Kochmann (*Arch. exp. Path. Pharm.*, 1920, **87,** 226-32).—Hæmolysis of blood-corpuscles from cows, which were washed 4 times in isotonic NaCl solution, is effected by 0·2 to 0·25% chloroform, 4% ether, and 10 to 15% alcohol solution at a temperature of 18° to 20°; 0·5 mg. chloroform and 8·5 mg. alcohol are united on hæmolysis with 1 milliard of blood-corpuscles. Relations between the molecular size and the hæmolytic effect could not be detected. —H. W.

224. The Variable Acidity of Hæmoglobin and the Distribution of Chlorides in the Blood. F. C. McLean, H. A. Murray, Jr., and L. J. Henderson (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 180-2).—When the heterogeneous acid-base equilibrium of the blood is disturbed from any cause, the new equilibrium is established by the migration of acid into and out of the cells. About two-thirds of this acid is hydrochloric acid.—D. H. de S.

225. Bau der roten Blutkörperchen und Hämolyse. H. Bechhold (*Münch. med. Woch.*, 1921, **68,** 127-30).—A theory of the structure of red cells is put forward based on observations with the ultra-microscope and with the ultra-filter. The stroma consists of a protein network with a skin of emulsified lecithin and cholesterin across the meshes. Hæmolysis occurs when one of the three components is removed. Stalagmometric measurements of the surface tension of lecithin emulsions in different salt solutions showed that the surface tension was at its maximum in physiological saline. Weaker or stronger salt solutions lowered this surface tension. Hæmolysis of red cells by hypertonic or hypotonic solutions is not therefore due to an osmotic effect, but to a lowering of the surface tension of the lecithin emulsion, whereby the lecithin is less securely attached to the protein framework.—J. H. B.

226. Kolloidstudien über den Bau der roten Blutkörperchen und über Hämolyse. E. Salén (*Biochem. Zeit.*, 1920, **110,** 176-80).—By treatment of blood-films with lipoid solvents and protein precipitants, and also by pepsin and trypsin solutions, the author concludes that the membrane of the red corpuscles consists of both lipoid and protein. —E. C. G.

227. Hæmagglutination. H. Schütze (*Brit. J. Exper. Pathol.*, 1921, **2,** 26-33).—The possibility of grouping dried human blood-specimens by reconstructing the serum for agglutination and using the undissolved residue for absorption has been demonstrated. Forensically, the test would be of most importance when proving dissimilarity between two specimens alleged to be derived from the same source. To prove their similarity would probably only be to furnish circumstantial evidence of more or less value according to the group in question and the frequency of the occurrence of that group in the population concerned. The Landsteiner theory that two substances, "A" and "B," with their corresponding agglutinins, "a" and "b," are concerned in the isoagglutination of human bloods has been confirmed by absorption tests.—W. D. H.

228. On Auto-Hæmagglutination. C. J. Bond (*Brit. Med. J.*, 1920, ii., 925-7, 973-6).—All red blood-corpuscles are capable of forming hæmagglutinogen under certain conditions. Agglutinogen, like agglutinin, exists in a non-specific form and in a graded series of specific forms; the specific and non-specific forms, although allied, are not identical in composition or character. Agglutinogen has so far only been found in combination with, or attached to, the surface or stroma of the red cells. It apparently does not exist in serum in the free or uncombined state. The specific and non-specific agglutinins, on the other hand, are present in the serum in the free state, and both kinds are removed by filtering the serum through a porcelain filter.—D. H. de S.

229. The Isoelectric Point of Red Blood-Cells and its Relation to Agglutination. C. B. Coulter (*J. Gen. Physiol.*, 1921, **3,** 309-23).—The H-ion concentration at which red corpuscles have no electric charge is at $P_H = 4{\cdot}6$. On the alkaline side of this they are negative; on the acid side, positive. The charge carried by sensitised cells on the alkaline side is smaller than that of normal cells. On the acid side, both kinds of cells "combine" with H and Cl ions; on the alkaline side with cations. The optimum for agglutination of normal cells is at $P_H = 4{\cdot}75$; for sensitised cells, at $P_H = 5{\cdot}3$. The latter value is related to the optimum for flocculation of the immune body.—W. M. B.

230. Laboratory Problems of Blood-Transfusion. H. T. Karsner (*J. Amer. Med. Assoc.*, 1921, **76,** 88-94).—A general review. Transfusion is safe if the bloods have been tested for compatibility. When citrated blood is used, there is a greater tendency to reaction than when the transfer is direct.—C. L. E.

231. Precautions Necessary in the Selection of a Donor for Blood-Transfusion. L. J. Unger (*J. Amer. Med. Assoc.*, 1921, **76,** 9-11).—Preliminary to transfusion the blood of every patient should be grouped, and then tested directly against that of the prospective donor, even if this is the mother of the recipient.—C. L. E.

232. Das Auftreten körniger Strömung in den Netzhautgefässen und die Erzielung der Senkungszahl des Blutes. Elschnig (*Med. Klinik*, 1921, No. 1, 9-10).—In cases with increased sedimentation of the blood-corpuscles the phenomenon of the "körniger Strömung" in the bloodvessels of the retina occurs in very much shorter time. The phenomenon can be observed with the ophthalmoscope by increasing of the intra-ocular pressure. (An observation identical with that described by Ploman in Abstract No. 3365, Vol. V., p. 535.)—H. W.

233. Untersuchungen über die Senkungsgeschwindigkeit der roten Blutkörperchen. G. Linzenmeier (*Arch. f. Gynäkol.*, 1920, **113,** 608-31).—The sedimentation of the blood-corpuscles is very much accelerated in the second part of the period of gestation, during the birth, and in the first 8 days after the birth. The phenomenon also can be observed in the first part of the pregnancy, but not regularly. The differential diagnosis between extra-uterine pregnancy and inflammatory adnex changes cannot be made by means of the sedimentation of the blood-corpuscles, because this phenomenon also appears in other states of inflammation. On the other hand, the reaction is of great importance for the differentiation between myoma and pregnancy. (For theoretical considerations see Abstract No. 2551, Vol. V., p. 404.)—H. W.

234. Über Abhängigkeit der Leukozytenzahl von der Körperstellung. G. Jörgensen (*Zeitsch. f. klin. Med.*, 1920, **90,** 216-34).—The number of the leucocytes is greater in the lying than in the standing posture. The difference may be more than 100%. These fluctuations occur whether the changes in posture are made quickly or slowly. These differences must be taken into account in all investigations of the number of the leucocytes.—H. W.

235. Osmosis as a Factor in the Local Accumulation of Leucocytes in the Body. F. Maltaner and E. N. Hoppe (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 216).—In aqueous solutions leucocytes move in the direction of the osmotic force and opposite to the direction of the diffusing substances in solution. This motion is explained as being due to the greater permeability of leucocytes for water, and the fact that their total mass is negligible as compared with their content of water.—D. H. de S.

236. Action of Light on Leucocyte Count. J. H. Clark (*Amer. J. Hyg.*, 1921, **1,** 39-62).—Direct radiation of rabbits' ears for 1 hour by an iron arc shows that far ultra-violet produces a marked lymphocytosis. The near ultra-violet has a depressing effect on the lymphocytes, and to a less degree on the polynuclears. The region between 450 and 650 $\mu\mu$ has a stimulating action on both lymphocytes and polymorphs, particularly on the former. The region beyond 650 $\mu\mu$ has no specific action.—J. A. H.

237. The Leucocytic Blood-Count of those Handling Radium for Therapeutic Purposes. T. C. Mottram and J. R. Clarke (*Arch. of Radiol. and Electrother.*, 1920, **24,** 345-50).—The handling of radium leads to a reduction in the polynuclear and lymphocyte counts. A return to normal is observed when the subject of the observations ceases to deal with radioactive substances.—T. R. P.

238. Über den Einfluss der ultravioletten Strahlen auf das Blut. K. Traugott (*Münch. med. Woch.*, 1920, **67,** 344-6).—Illumination with ultra-violet light produces in man an increase of 25% in the white corpuscles. This increase is evenly distributed between lymphocytes and polymorphs. Blood taken from the body clots more readily and contains more platelets than usual.—J. H. B.

239. Studien über Blutplättchen—II. R. Degkwitz (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11,** 144-55).—When parenteral injections of heterogeneous (non-poisonous !) protein were made in rabbits, the same fluctuations of the number of the thrombocytes appear as in infective diseases (diminution succeeded by an increase). The protein of the same species, fats and carbohydrates, and proteins without antigenic effects do not cause the reaction. These changes cannot be observed after the formation of an active

immunity, in the state of passive immunity, or in anaphylactic shock. The protein cleavage products up to the tripeptide stage cause the same changes as antigens, but this reaction always appears again after reinjections.—H. W.

240. Vicarious Blood-Platelet Formation. C. H. Bunting (*Bull. Johns Hopkins Hosp.*, 1920, **31,** 439-40).—The author accepts without question Wright's view that platelets are formed by the segmentation of pseudopodia of the megalocaryocytes of bone-marrow. W. H. Brown, after the destruction of these cells in rabbits, showed that the platelets might bud off from other marrow cells or from the "transitional cells" of the blood. The present author records observations in influenza that lymphocytes in the circulating blood act in the same way (compensatory formation).—W. D. H.

241. Blood-Coagulation. E. C. Mason (*J. Lab. and Clin. Med.*, 1921, **6,** 195-9).—The report is in the nature of a theoretical discussion. The factors considered necessary for the clotting of blood are fibrinogen, calcium, and a "phospholipine" complex. Fibrinogen and calcium are present in the plasma of the circulating blood, the "phospholipine" complex is present in the circulating blood in an inactive form.—D. H. de S.

242. Blutungs- und Gerinnungszeit, ihre Beziehungen und ihre Klinische Bedeutung. P. Morawitz (*Med. Klinik*, 1920, Nr. 50, 1289-91).—Cessation of bleeding is caused by agglutination of thrombocytes, which must be distinguished from the process of coagulation. The "bleeding time," as distinguished from the "coagulation time," can be determined by pricking the finger-tip and sucking up the blood every half-minute with filter-paper. In some diseases the bleeding time is prolonged, and the coagulation time normal (thrombopenia). In other cases the 2 phenomena run parallel, as in hæmophilia, cholæmia, and chronic poisoning.—H. W.

243. Beschleunigung der Blutgerinnung durch Milzdiathermie. Nonnenbruch and W. Szyszka (*Münch. med. Woch.*, 1920, **67,** 1064).—Diathermy applied to the spleen, but not to any other part of the body, produces a decrease in clotting time which may last as long as 1 hour.—J. H. B.

244. Blood-Changes in a Case of Hæmophilia after Transfusion. H. A. Bulger (*J. Lab. and Clin. Med.*, 1920, **6,** 102-4).—A hæmophiliac boy was transfused with 300 c.c. of his mother's blood. Before transfusion the coagulation time of his blood was over 80 minutes; the day after transfusion it was 10 minutes, being the same as that of a normal control. One month later it still was less than before transfusion.—D. H. de S.

245. Hæmostatic Agents and the Spontaneous Changes in Coagulation Time following Hæmorrhage. P. J. Hanzlik (*J. Lab. and Clin. Med.*, 1920, **6,** 59-61).—The author criticises Hamilton's methods and results (see Abstract No. 1840, Vol. V., p. 290), and maintains that hæmostatic serum is inert as an accelerator of coagulation of blood and plasma *in vitro*, and as a hæmostatic *in vivo*.—D. H. de S.

246. De l'action anticoagulante du plasma phosphaté. P. Nolf (*Réunion soc. belge biologie*, 4 décembre, 1920, 1573-5).—Le plasma paraffiné de poule ou de lapin, traité à deux reprises par une émulsion de phosphate tricalcique (plasma phosphaté de Bordet et Delange) exerce une action anticoagulante manifeste sur le sang et le plasma d'oiseau et de lapin. On peut donc, en enlevant une partie de ses facteurs coagulants au plasma, le transformer en un liquide doué de propriétés anticoagulantes.—L. F.

247. De l'action de l'hirudine in vitro et in vivo sur les effets toxiques du sérum traité par l'agar. E. Zunz et Marthe Van Geertruyden (*Réunion soc. belge biologie*, 4 décembre, 1920, 1561-3).—Dans des conditions appropriées, l'hirudine atténue, *in vivo* et *in vitro*, la nocivité pour le cobaye du sérum traité par l'agar. Le traitement par l'agar ne rend pas ou guère toxique pour le cobaye le plasma hirudiné, mais confère par contre au plasma oxalaté la propriété d'amener les symptômes du choc anaphylactique et la mort.—L. F.

248. Physikalisch-chemische Beiträge zum Problem der Blutgerinnung. E. Atzler and E. Döhring (*Biochem. Zeit.*, 1920, **110,** 245-57).—The authors fail to detect any evolution of heat during blood-clotting, and calculate that it must be less than 1·5 cals. per gm. of fibrinogen. Neither could any changes be observed during clotting, either in volume or electrical conductivity.—E. C. G.

249. Mécanisme de l'action de la morphine sur la coagulabilité du sang. Doyon (*Compt. rend.*, 1920, **171,** 1236-7).—The injection of morphine into a mesenteric vein has the same effect on the coagulability of the blood in dogs as injection of peptone. The result is not obtained in all dogs, and not at all in rabbits.—J. A. M.

250. (1) Participation des noyaux cellulaires aux phénomènes de sécrétion. Propriétés anticoagulantes de l'acide nucléinique de l'intestin. Doyon (*Compt. rend.*, 1920, **171,** 1402-3). (2) **Action anticoagulante de l'acide nucléique du pancreas. Stabilité et caractères du plasma nucléaté.** Doyon (*ibid.*, 1921, **172,** 134-5).—(1) A solution of nucleic acid, prepared from the intestine of the dog or horse, added to freshly-shed. dog's blood, prevents coagulation. Subsequent addition of small quantities of serum and calcium chloride do not lead to clotting in 12 hours, but further addition of serum and calcium chloride brings about clotting in 2 or 3 hours more. (2) Nucleic acid derived from the pancreas has the same anticoagulant property as that derived from the intestine, but possibly more marked. By the use of nucleic acid a relatively stable plasma can be obtained, and can be used for experimental work. The author holds that antithrombin is derived from cell nuclei, and that nuclei take part in the formation of secretions generally.—J. A. M.

251. Der Einfluss der intravenösen Injection hypertonischer Lösungen auf die Zusammensetzung und die Gerinnungsfähigkeit des Blutes. P. Schenk (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11,** 166-77).—The coagulation of the blood is much accelerated by intravenous injections of Ca solutions (10 c.c. 30%) and by infusions of NaCl solutions (100 c.c. 10%) or dextrose solutions (200 c.c. 20 to 30%). Fever and hydræmia are observed in consequence to the NaCl and dextrose infusions, especially in the last case.—H. W.

252. Über Faserstoffmangel im Blute bei einem Falle von Hämophilie. F. Rabe and E. Salomon (*Deutsch. Arch. f. klin. Med.*, 1920, **132,** 240-4).—In the plasma in a case of hæmophilia ammonium sulphate gave only a fine floccular precipitate after 2 to 3 hours. Even this might have been due to traces of globulin. No coagulation occurred on heating until albumins were precipitated at 67° to 69° C. Subsequent formation of fibrinogen was not observed, but addition of fibrinogen led to clotting of the cell-free plasma.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

253. Über den Einfluss der ultravioletten Strahlen auf das Blut. K. Traugott (*Münch. med. Woch*, 1920, **67,** 344-9).—Ultra-violet rays fail to produce even a temporary increase in the number of erythrocytes, but there is a uniform increase in the white cell count in both venous and capillary blood. When the irradiation has lasted for less than 15 minutes the increase may not be the same in both cases. The relative cytological composition of the blood remains unchanged, as leucocytes and lymphocytes are increased in the same proportion. These results are explained on the theory of Lazarus that it is the elements of higher atomic weight which absorb and transform the radiant energy. As these occur more abundantly in nuclei, the white cells respond to the stimulus of the ultra-violet light, while the non-nucleated red cells remain unaffected. An increase in the number of blood-platelets, and hence in the rate of clotting, is also observed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

254. Über Mikrocapillarbeobachtungen bei einem Fall von Raynaud'scher Krankheit. A. Halpert (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11,** 125-37).—A typical case of Raynaud's disease was examined by means of Weiss's method. The circulation

of the blood resembled that seen in venous congestion during the intervals. But during the attack all the capillaries showed stasis and changes in their form (protuberances, spastic contractions). Stimulation by warmth produced a contraction of the capillaries, and stasis disappeared. The reaction to cold was the same as in normal cases. —H. W.

255. Blood-Phosphates in the Lipæmia produced by Acute Experimental Anæmia in Rabbits. W. R. Bloor and E. D. Farrington (*J. Biol. Chem.*, 1920, **45,** 171-87).—Of the phosphoric acid containing constituents of the blood, the one most markedly affected by anæmia and consequent lipæmia, is the lipoid phosphorus. When the lipoid phosphorus is considerably above normal in either plasma or corpuscles, there is an accompanying increase of inorganic phosphate, so that these two forms appear to be directly related.—J. C. D.

256. The Physiological Effects of Short Exposures to Low Pressure. E. S. Sundstroem and W. R. Bloor (*J. Biol. Chem.*, 1920, **45,** 153-70).—A self-regulating and inexpensive apparatus for animal experiments at low pressure is briefly described, as well as a convenient and accurate method for obtaining the hæmatocrit value by use of a high-power centrifuge. Experiments on rabbits which have been subjected to a small hæmorrhage and then exposed for a short period of time to various pressures demonstrate that at very low pressures a decrease in the size of the red corpuscle occurs. The most characteristic feature of the low-pressure experiments is a constant decrease in the lipoid phosphorus of the plasma. It is suggested that this indicates an enrichment of the erythropoietic organs with lipoid material, and that this may be the first phase of a stimulation of these organs resulting from the lowered pressure.—J. C. D.

257. Protein and Residual Nitrogen in the Serum of Various Animals. G. Quagliariello (*Atti. R. Accad. Lincei*, 1920, [v.], **29,** ii., 213-8).—The investigations show that, whereas the proportion of protein nitrogen in the blood of animals of different types varies in the ratio 1 : 1,700, the proportion of residual nitrogen varies only from 1 to 30, or, if reptiles and birds are included, from 1 to 100. This relative constancy of the proportion of residual nitrogen in the blood of all animals, of whatever class, when considered in relation to the wide variation of the protein content, shows that the fundamental function of the blood consists in the transportation to and from the tissues of the anabolic and katabolic materials (amino-acids, ammonia, etc.). Only when the organisation becomes more perfect and the blood assumes other functions does enrichment of the blood in colloidal substances proceed *pari passu* with development of the cardio-vascular apparatus.—W. D. H. (*J. C. Soc.*).

258. Gasometric Determination of Nitrogen and its Application to the Estimation of the Non-Protein Nitrogen of Blood. R. L. Stehle (*J. Biol. Chem.*, 1920, **45,** 223-8).—Hypobromite acting on urea and on ammonium salts liberates the theoretical amount of nitrogen if the reaction is carried out at reduced pressure. The method is an alternative to the Kjeldahl method.—H. E. R.

259. Der anteil der Polypeptide und Aminosäuren am Reststickstoff des Blutes. F. Schweriner (*Zeit. f. exp. Path. u. Therap.*, 1920, **21,** 129-35).—Details are given of the methods of estimation of amino-acid and polypeptide nitrogen in blood. In many pathological conditions—apoplexy, tabes, malaria, uræmia, tuberculosis, cholelithiasis —polypeptide nitrogen is not recognisable in the blood. In a large number of patients with tumours who were examined the blood contained peptide nitrogen. In a few cases of acute liver diseases the polypeptides were increased, but not the amino-acids. Acute yellow atrophy of the liver is distinguished from all the other diseases by an increase of amino-acid nitrogen sufficiently large to be of diagnostic value. In kidney disease the amino-acid nitrogen may be increased, but in any case it forms only a small fraction of the total non-protein nitrogen.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

260. Relationship between Cholesterol and Cholesterol Esters in the Blood during their Absorption. A. Knudson (*J. Biol. Chem.*, 1921, **45,** 255-62).—Feeding dogs on cholesterol and cholesterol esters causes an increase in the total cholesterol in the blood, but no increase in cholesterol esters; this indicates that cholesterol esters are hydrolysed before absorption. In general, the increase in the corpuscles is greater than in the plasma. The corpuscles probably contain only free cholesterol.—H. E. R.

261. Blood-Cholesterol in Pernicious Anæmia and Pneumonia. H. A. Kipp (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 25-7).—In pernicious anæmia the cholesterol content of the serum is depressed to a varying degree below the normal, running parallel with the severity of the symptoms and the diminution in the erythrocyte content and hæmoglobin percentage of the blood. In pneumonia the cholesterol in the serum was found to vary according to the severity of the disease, the involvement of lung tissue, and the development of the pneumonic exudate. In the first few days the cholesterol content is depressed, but resolution of the pneumonic condition is accompanied by a rise in the cholesterol content of the serum.—D. H. de S.

262. Beiträge zum Bilirubingehalt des menschlichen Serums bei Gesunden und Kranken. R. Botzian (*Mitteil. a. d. grenzgebiet. d. Med. u. Chirurg.*, 1920, **32,** 549-66).—The bilirubin content shows fluctuations of short wave-length in cases of hæmolytic icterus. The "hæmolytic" bilirubin gives no direct diazo-reaction (in some cases the reaction is only retarded). The extirpation of the spleen causes the disappearance of the icterus and decreases the bilirubin content. But 4½ months after the operation the bilirubin content increases again, in consequence of compensatory growth of reticulo-endothelial tissue. At the same time, the hæmolytic bilirubin is changed into "Staungsbilirubin," which gives the direct and indirect diazo-reaction. The same quantity of bile-pigment is found in the arterial and venous blood of the spleen.—H. W.

263. Indican in Serum. I. Snapper and v. Vloten (*Ned. Tijdsch. v. Geneesk.*, July, 1920, 136).—Excess of indican points to kidney inefficiency. Excess is detected by treating 3 to 4 c.c. of serum with the same amount of 20% CCl_3COOH to remove protein and diluting 2 to 5 c.c. of the filtrate to 10 c.c. with water. Then 1 c.c. of thymol spirit and 10 c.c. of the Obermayer reagent are added. After 20 mins. the mixture is shaken with 2 c.c. of chloroform, and if the chloroform turns pink in half an hour hyperindicanæmia is present.—W. D. H. (*Chem. Abstr.*).

264. Über Urikämie bei Kohlenoxydvergiftung. G. Czoniczer (*Münch. med. Woch.*, 1920, **67,** 1121).—The author estimates the uric acid in the serum by Neubauer's modification of the Folin-Denis method. The average figure was 2 to 4 mg. %. In 5 cases of CO-poisoning the figure was 6 to 8.—J. H. B.

265. Neue Beiträge zur Kenntnis der anorganischen Stoffe des Blutes. I. Kationen und Hyperphosphatämie bei Morbus Brightii. J. Feigl (*Zeit. physiol. Chem.*, 1920, **111,** 280-6).—The "acid-soluble" phosphorus content of the blood is much higher than normal, while the K, Na, Ca, and Mg do not increase to anything like the same extent. On the other hand, the ammonia rises to as much as 8 times the normal amount.—H. W. D.

266. Determination of Chlorides in Blood. A. S. Wetmore (*J. Biol. Chem.*, 1920, **45,** 113-8).—The removal of the proteins was carried out by copper hydroxide oxalate; and most of the phosphate was precipitated by an excess of calcium hydroxide. The titration of the chlorides in the filtrate is made by the procedure of Rappleye (Abstract No. 2435, Vol. III., p. 427), which is a simple modification of the Volhard principle.—J. C. D.

267. Physikalisch-chemische Untersuchungen an Körperflüssigkeiten. Der Zustand des Chlors in Serum und Plasma—I. S. Rasznyák (*Biochem. Zeit.*, 1920, **110,** 60-65).—Ultrafiltration is recommended as a preliminary to the estimation of chlorides

in solutions containing much protein when it is not desirable to destroy the organic matter. The author by such a method also concludes that in plasma no chlorides are "combined" with proteins, a view which some authors have held to explain discrepancies between total and soluble chlorides.—E. C. G.

268. Über das Vorkommen von Phosphaten im menschlichen Blutserum—XI. J. Feigl (*Biochem. Zeit.*, 1920, **111**, 108-14).—Résumé of previous work.—E. C. G.

269. Estimation of Sodium in Blood. E. A. Doisy and R. D. Bell (*J. Biol. Chem.*, 1921, **45**, 313-23).—The sodium is precipitated as sodium cæsium bismuth nitrite, and washed with a saturated solution of the same salt in 50% acetone. The salt may be estimated gravimetrically, volumetrically, or colorimetrically. The authors prefer the volumetric method.—H. E. R.

HEART

270. Origin and Conduction of the Heart-Beat. J. A. E. Eyster and W. J. Meek (*Physiol. Reviews*, 1921, **1**, 1-43).—A review.—W. D. H.

271. Comparative Investigations on Vagal Effects on the Heart produced by Pressure on the Neck and on the Globe of the Eye. E. W. G. Vinnis (*Genessk. bladen.*, 1920, **22**, 41-67, Dutch).—Pressure on the vagus trunk in the neck produces somewhat different effects to the reflex ones obtained by pressure on the eye. The effect of the former is more pronounced in adults, and that of the latter in children. The results are expressed in the Engelmann terminology. The most marked prolongation of the A-C interval was found on pressure on the r. vagus. In some cases ventricular systoles may not follow on auricular contractions, and this is explained as a bathmotropic effect. In arrhythmia associated with auricular fibrillation a 6 sec. ventricular arrest may be produced, while a pulsus alternans may be resolved by vagal pressure. It is also reported to cause premature contractions of the ventricle. The effects of pressure on the eye are much less regularly reproducible; extrasystoles may be caused, or, if present, abolished, but effects on arrhythmia are rare.—C. L. E. (*Ber. ü. d. ges. Physiol.*).

272. Über Trennung der intercardialen Vagusfunktion von der motorischen Leistung des Froschherzens—II. L. Haberlandt (*Zeit. Biol.*, 1920, **72**, 163-76; compare Abstract No. 2908, Vol. V., p. 464).—The total intracardiac vagus apparatus can be disconnected in its effect permanently or temporarily in frog's hearts, which are resuscitated from the state of water-rigor or heat-rigor by irrigation with blood. These experiments are, in the opinion of the author, a further argument for the myogenic theory.—H. W.

273. Gaswechsel und mechanische Leistung des Froschherzens—II. E. Lüscher (*Zeit. Biol.*, 1920, **72**, 107-28).—The method was described in a former publication (Abstract No. 157, Vol. V., p. 25). The author now investigates the gaseous metabolism of the heart when contracting under after-load conditions, and finds that the oxygen consumption increases with the degree of after-loading if the initial (diastolic) pressure is low (100 mm. H_2O); when the diastolic pressure is high (400 mm.), the O_2-usage remains constant, or even decreases a little with increase of after-load pressure. The O_2-usage, with an after-load pressure of 300 mm. H_2O, also remains the same, or shows a decrease when the initial pressure increases from 80 to 300 mm. H_2O; that of isotonic contractions increases with increase of initial tension. The oxygen consumption of the various forms of contraction (isotonic, isometric. and after-load) tends to the same maximum. A stimulus, therefore, can give rise to the maximum of energy exchange under different mechanical conditions. These conditions must be so chosen that the muscular elements have, at the commencement of contraction, a fixed relation between their surface and their volume. Departure from this form, in one or the other direction.

leads to a decrease in the gaseous exchange. The value for the after-load (and perhaps also for the isometric) contraction is: O_2 consumption $= 8{\cdot}6 \times 10^6 \times$ volume $\times$ pressure. In the isotonic contraction the constant has a different value with each initial pressure. There is a difference between the total and the effective work of the systole. In the after-loaded systole the efficiency is 31%, and is reached under the same conditions as the maximal work.—H. W.

274. Über die zeitliche Beziehung zwischen Refractärphase und Kontractions sablauf des Herzens. H. Dennig (*Zeit. Biol.*, 1920, **72,** 187-200).—The refractory phase and the period of contraction of the heart are not necessarily identical. It is true that elevation of temperature shortens both. But there are other experiments which show that the relationship is not fixed. For example, in a fatigued heart it is most excitable long before the end of the diastole. In the normal heart this stage is at the end of the diastole. In poisoning with Ca or chloral hydrate, increase of excitability begins even during systole, and reaches a maximum at the beginning of diastole. On the other hand, in potassium poisoning, excitability begins to increase at the end of diastole and reaches its maximum after diastole is concluded.—H. W.

275. Weitere Versuche über polare Stromwirkungen am Froschherzen: Die Temperaturabhängigkeit des Kathodeneffects. (Nebst Beobachtungen über die Herztätigkeit in der Kälte). H. Rosenberg (*Zeit. Biol.*, 1920, **72,** 201-28; compare Abstract No. 3420, Vol. V., p. 544).—A method is described by which it is possible to register graphically the local changes of irritability with naturally circulated frog-hearts and unipolar galvanic currents. Decrease of excitability can be demonstrated by rhythmic stimulation with faradic currents at the situation of either the kathode or the anode. These faradic excitations produce artificial heart-beats, which give place to natural beats if the excitability decreases. Excitability is diminished at all temperatures if the anode is the effective electrode. But if the electrode is the kathode, excitability is reduced during the polarisation in the warmth only if strong currents and repeated polarisation are employed. But in the cold (from 7° to 8° downwards) the first polarisation with feeble currents is often sufficient to reduce the excitability. Warming after polarisation in the cold produces the same state as seen in a warm heart which is not irrigated. The author offers an explanation of the depressive effect of the kathode.—H.W.

276. Zum Vergleich des Ablaufs des Electrocardiogramms mit der Stärke der Herzkontraktion. F. B. Hofmann (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11,** 156-65).—The height and duration of the one-phase action current decrease with the contraction of the heart. The approach of the 2 deflections of the two-phase action current is a sign of loss in strength of the process of excitation connected with it.—H. W.

277. Die Ursache des Stillstandes nach der ersten Stanniusschen Ligatur. F. B. Hofmann (*Zeit. Biol.*, 1920, **72,** 229-56).—Excitation of the intracardiac inhibitory nerves does not cause the heart to stop after the first Stannius ligature. The phenomenon occurs also after extirpation of these nerves. The stoppage is the consequence of the suppression of the ventricle automatism by the preceding permanent excitations from the sinus. The duration of the stoppage is shortened when the automatic capacity of the ventricle rises. The heart was perfused with Ringer's solution containing only 1% NaCl. If the experiment is made in such a way that the conduction of the sinus excitations can be interrupted optionally, the stoppage after the first interruption is the longest one. The duration of the later stoppages is shorter, and corresponds to the inhibition effect of an interpolated series of extrasystoles. The sudden interruption of the blood streaming into the heart, as in the usual method of applying the first ligature, produces also a protraction of the time of standstill.—H. W.

278. Wärmeakzeleration des Herzens und Muskelarbeit. A. Glaus (*Arch. exp. Path. Pharm.*, 1920, **87,** 293-308).—The pulse frequency increases with passive heating.

and this is due to the higher temperature of the blood in the right heart. The increase of blood-temperature raises that of the expired air. The temperature of the expired air increases with muscular work by about 4·5° to 5·5°, of which 1° to 2° are dependent on this muscular work itself. The acceleration of the pulse is, in addition, the result of other influences (more frequent respiration, psychomotor irradiation, products of metabolism).—H. W.

279. Elektrocardiographische Studien bei akuten Vergiftungen. E. Schott (*Arch. exp. Path. Pharm.*, 1920, **87,** 309-71).—A number of substances influence the electrical phenomena in the heart (salicylic acid, Na, benzol, chlorethyl, chloroform, ether, alcohol). The change in the electrocardiogram is specific for these poisons, and ceases when the poisonous effect passes off. Other poisons (nitrobenzol, acetone, chloral hydrate) produce no such changes.—H. W.

280. Contribution à l'étude du rôle biologique du potassium sur le cœur. W. Libbrecht (*Arch. intern. physiol.*, 1920, **15,** 446-58, 7 figs.).—L'auteur s'élève contre la théorie de la radio-activité physiologique du potassium. Pour Zwaardemaker et son école, le potassium agirait principalement par sa radio-activité, et pourrait être, dans une série de cas où sa présence est indispensable, remplacé par n'importe quel corps radio-actif, en quantité radio-active équivalente. D'une série de nouvelles expériences, l'auteur conclue que cette action dépend uniquement de la présence de potassium sous forme d'ions libres. Rien ne prouve que la radio-activité joue un rôle physiologique quelconque.—L. F.

281. Die Nikotinwirkung am isolierten Froschherz. J. Hett (*Arch. exp. Path. Pharm.*, 1920, **88,** 30-8).—Nicotine, even in doses as small as 0·0002 gm., exerts a vagus action which is reversible, and does not occur after atropinisation of the heart. There is, further, an injury to the conducting mechanism and to the muscle fibres themselves. The electrical excitability falls after large doses (0·001 gm.). Part of the poison appears to be firmly combined in the heart's substances.—W. D. H.

282. Die Wirkung des Strychnins auf die Refractärperiode und die Überleitungszeit am Froschherzen. E. Frey (*Arch. exp. Path. Pharm.*, 1920, **87,** 377-91).—Strychnine lessens the excitability and frequency of the frog's heart, a protraction of the transition time. The refractory phase and vigour of beat depend on the size of the preceding contraction.—H. W.

283. Über die Bedeutung der Calcium- und Kaliumionen bei Giftwirkungen am Herzen—I. S. G. Zondek (*Arch. exp. Path. Pharm.*, 1920, **87,** 42-55).—The author shows in the case of 2 different poisons, chloral hydrate and muscarine, that effects of poisons on cells can be generally changed in their intensity, and also in their action, by dissarrangement of the electrolytic concentrations, which are necessary for the life of cells. There is a toxicological analogy between chloral hydrate and K-ions: both cause a diastolic cessation of the heart, their effects can be summated, and the Ca-ions have an antagonistic influence on both.—H. W.

284. Über einige Fälle von partiellem Sinusvorhofblock und von hochgradiger Sinusarrhythmie am Menschen. Ein Beitrag zur Theorie der Reizbildung und Reizleitung. M. Straubel (*Deutsch. Arch. f. klin. Med.*, 1920, **133,** 193-215, 216-22).—H.W

285. High-Grade Heart-Block: The Influence of Posture, Respiration, and Exercise. S. C. Smith (*J. Amer. Med. Assoc.*, 1921, **76,** 17-20).—A heart-block persisting from infancy for 20 years temporarily vanished during forced expiration; this change was accompanied by a change in the position of the heart.—C. L. E.

286. Cardiac Lesion in Two Instances of Intraventricular Heart-Block. B. S. Oppenheimer and H. E. B. Pardee (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 177-9).—The lesion in the one case was in the right branch of the A-V bundle, in the other case in the left branch. The main deflections in the two sets of electrocardiograms were in

opposite directions. The authors suggest that the usually accepted electrocardiographic interpretation of block of the right and left branches of the A-V bundle may have to be revised.—D. H. de S.

287. Kammeralternans und Häufigkeit des Herzschlages (Latenter und manifester Alternans Zustand). E. Koch (*Zeit. exp. Path. u. Therap.*, 1920, **21,** 319-31).—A method is described with which it is possible to demonstrate that a pulsus alternans only occurs when a functional difference exists in the different parts of the ventricular muscle. Local mechanical damage of the ventricle may cause every 2nd, 3rd, 4th, etc., contraction to be a big one.—H. W.

288. Der Herzalternans. B. Kisch (*Ergebnisse der innern Med. u. Kinderheilk.*, 1920, **19,** 294-376).—A summary of the present state of knowledge of the subject, with a critical discussion of different theories.—H. W.

289. Die Flimmerarrhythmie. M. Semerau (*Ergebnisse der innern Med. u. Kinderheilk.*, 1920, **19,** 134-293).—A summary of the present state of knowledge of the subject. The expression "Flimmerarrhythmie" is used instead of the current expressions "Arrhythmia perpetua" or "Pulsus irregularis perpetuus."—H. W.

290. On Fibrillation of the Heart—I.-III. S. de Boer (*Konink. Akad. v. Wetensch.*, Amsterdam, 1920, **23,** 319-28, 329-37, 533-41).—I. In continuation of previous work (Abstract No. 1438, Vol. V., p. 231) it is shown that the conditions for incidence of ventricular fibrillation in the frog are that the refractory phase must be shortened and the conductivity lowered; these conditions obtain immediately after the close of the refractory phase, and are especially well seen in the bloodless heart. If digitalis is given beforehand, deformed systoles, but not fibrillation result from a stimulus given just after a contraction; this is because, although conductivity is lowered, the refractory phase is lengthened, so that the circus excitation cannot become established. II. The clinical relation between fibrillation and grouped extrasystoles is also seen in the frog's heart, where a stimulus given at the close of the refractory phase may precipitate either. The same conditions are responsible in both cases, but with this difference, that in fibrillation conduction is very slow, and the progress of the wave incoordinated and jerky, whereas in the grouped extrasystoles the progress, though slow, is regular. One form may easily pass into the other. III. Ventricular fibrillation or grouped extrasystoles can also be induced by stimulation of the auricle by a single shock under such conditions that the excitation wave reaches the ventricle at the close of the refractory period. Since in most cases the wave reaches the ventricle too late, the experiment more often succeeds during the post-compensatory systole (which has a longer refractory phase and increased conductivity). The result is often prevented by the occurrence of auricular fibrillation. (The same main results are also stated in the author's papers in *Deutsch. med. Woch.*, 1920, **46,** 1187-9, 1353-4.)—L. C. E

291. On the Artificial Extra-Pause of the Ventricle of the Frog's Heart. S. de Boer (*Konink. Akad. v. Wetensch.*, Amsterdam, 1920, **23,** 542-51).—A stimulus applied to the auricle is followed by a ventricular pause without previous ventricular extrasystole, provided that an auricular extrasystole is produced at a moment when the ventricle is refractory (Dastre, Engelmann). The experiment succeeds more often if the refractory phase of the ventricle is prolonged by giving drugs such as veratrine, antiarine, digitalis, or $BaCl_2$, or during a post-compensatory contraction following a premature systole. But artificial pauses may also result from stimuli applied to the auriculo-ventricular groove towards the close of ventricular diastole, provided the refractory phase is lengthened as above. This is because the auricular systole following the stimulus originates partly from the normal sinus wave and partly from the artificial stimulus; the two waves annihilate each other, and the ventricle being refractory, a pause results.—C. L. E.

292. On Artificial and Spontaneous Changes of Rhythm in the Bled Frog's Heart. S. de Boer (*Konink. Akad. v. Wetensch.*, Amsterdam, 1920, **23,** 552-60).—After deprivation of blood or administration of digitalis, veratrine, etc., the frog's heart often shows a halved rhythm; this happens when the ventricular refractory phase lasts longer than a sinus period (see Abstracts Nos. 694-7, Vol. II., pp. 174-5). Such a condition can be brought about at will—*e.g.*, if a stimulus is applied to the auriculo-ventricular groove during a ventricular extra pause (see preceding abstract).—C. L. E.

CIRCULATION

293. Experimentelle Studien uber die Eigenschaften überlebender Gefässe unter Anwendung der chemische Reizmethode. E. Rothlin (*Biochem. Zeit.*, 1920, **111,** 219-335).—Three papers submitted in part as a thesis in Zurich, and constituting an excellent monograph with abundant references to recent work upon the behaviour of various isolated tissues. The work is not particularly original, but the author has gone over a large field, repeating the experiments of others and attempting to explain contradictions, and his numerous experiments, which are recorded graphically, together with his discussions, are an admirable example of care and patience. The first paper is general, dealing with the manner of employing strips of arteries, veins, or other tissues for such experiments, and most striking are the findings in connection with the importance of oxygen. Oxygen acts as a vaso-constricting substance, and perfusion of tissues with oxygenated Ringer's solution can be readily shown to cause increase of tone. Again, tissues frequently pass into rhythmical contractions; these are increased by oxygenation and diminished or abolished by removal of oxygen, all of which points to the physiological and not pathological origin of the rhythmic movements. The question is considered as to what may be the value to the organism of this rhythmical contractile power of bloodvessels. Whether, for example, in any vertebrates it can assist blood-circulation. The answer is in the negative, for the rhythmic movements are not organised in such a way as to aid the propagation of the blood-stream in one direction. The author concludes rather that this is another example of the survival of a primitive function. It may be noted that the rhythmic movements of bloodvessels (arteries, veins of horse, cow, pig, etc.) can be elicited after ten days' cold storage, which facts help us to regard bloodvessels as much more active organs than we usually consider them. In the absence of free oxygen, various substances still excite contractions and rhythmic movements of bloodvessels—adrenaline, for example, and the other familiar substances of amine type—and apparently during the clotting of blood, or merely on standing when shed, such substances are produced, and this fact, that blood may acquire vaso-constrictor properties, must be carefully considered in connection with such experiments. Its physiological import is also worthy of attention. Another important point illustrated especially by adrenaline is that, according to the dose, the effect upon vessels may be either constrictor or dilator. A small dose causes vaso-dilation, a large dose constriction. Organs of different animals and of different parts of the same animal behave very differently in this respect. The papers are filled with most interesting details, to which the reader is referred.—E. C. G.

294. The Effect of Solutions of Certain Salts and Colloids on the Permeability of the Capillary Walls. A. H. Smith and L. B. Mendel (*Proc. Soc. Exp. Biol. and Med.* 1920, **17,** 201).—After the injection intravenously into rabbits of an isotonic solution of chloride, bromide, thiocyanate, nitrate, or acetate of sodium, equal in volume to the estimated blood-volume, the blood-volume returned to normal in 30 minutes. When the tartrate, citrate or sulphate was used, the blood-volume remained higher than

normal throughout the experiment—*i.e.*, for more than 2 hours. Acacia also sustained the increased blood-volume, while M/15 hydrochloric acid, calcium chloride, or colloidal silver produced no delay in the removal of fluid from the circulation.—D. H. de S.

295. The Measurement of Capillary Blood-Pressure in Man. L. Hill and J. M. McQueen (*Brit. J. Exper. Pathol.*, 1921, **2**, 1-7).—That pressure which stops the flow through and expresses blood from the skin has been generally taken as signifying the capillary blood-pressure. In truth, it indicates the pressure in the small arteries which feed the compressed part after an allowance has been made for error arising from the pressure required to deform the horny layer of the skin. The method devised measures this error and arrives at the true pressure in the small arteries. The pressure of a small jet of water is found which will just blanch the skin of the hand held at heart level (1) in the normal condition, and (2) with the capillaries at zero pressure after the veins of the forearm have been emptied by gravity and the brachial artery occluded by a tourniquet. When (2) is deducted from (1) a reading of about 10 mm. Hg is obtained. Reference is made to previous measurements of capillary pressure in the brain, etc., and to recent experiments carried out on transparent membranes of frogs, mice, etc., by one of the authors (L. H.). These show that a momentary compression equal to 2 to 5 cm. water suffices momentarily to check the flow of corpuscles in the arterioles or its main capillary branches. The true capillary pressure, as indicated by these figures, is a very low one, and theories of lymph formation, etc., based on a capillary pressure of some 30 mm. Hg, must be modified accordingly. The relation of the swelling of the tissue cells to the capillary circulation in inflammation is discussed, also the relation of the pressure of the cerebro-spinal fluid, aqueous humour, and salivary secretion.—W. D. H.

296. Functional Activity of Capillaries and Venules. D. R. Hooker (*Physiol. Reviews*, 1921, **1**, 112-40).—A review.—W. D. H.

297. Blutdrucksteigerung und Niere. V. Monakow (*Deutsch. Arch. f. klin. Med.*, 1920, **133**, 129-52).—Permanent increase of the blood-pressure is always caused by abnormal contractions of the arterioles in wide areas. A spastic component also participates in cases in which the arterioles of an extended territory show organic changes. These contractions of the bloodvessels may be caused by the most different agents. The general explanation of this symptom, as a disease of the kidneys, is not possible.—H. W.

298. Professor August Krogh. Et utdrag av hans Nobelprisbelörnede arbeide. T. G. (*Medicinsk. Revue*, 1921, **38**, 15-19; Danish).—A general account of the work on the capillaro-motor mechanism and of its importance in medicine.—C. L. E.

RESPIRATION

299. Visceral Sensory Nervous System. III. Lung Automatism and Lung Reflexes in Reptilia (Turtles: Chrysemys elegans, Malacoclemmys lesueurii. Snake: Eutenis elegans). A. J. Carlson and A. B. Luckhardt (*Amer. J. Physiol.*, 1920, **54**, 261-306).—In the turtle, the respiratory act inhibits the lung tonus reflexly, the efferent path being the vagus. The centre is not identical with the respiratory centre, although functionally associated with it. Both centres are affected in the same way by asphyxia; but the lung motor centre is more sensitive to afferent depressor impulses ("shock"). Stimulation of the peripheral end of the vagus causes tonic contraction of the lungs, with no indication of inhibition. The lung motor centres are inhibited by strong stimulation of the central ends of the vagi or the inferior laryngeal. Reflex contraction of the lung is produced by inflation, deflation, weak stimulation of the vagi, or mechanical stimula-

tion of the larynx or nares. It is also brought about by stimulation of the alimentary or genito-urinary tract, or cutaneous nerves. The same conclusions apply to the snake, except that the reflexes from viscera below the neck were not studied.—W. M. B.

300. Studies on the Respiratory Centre. I. Behaviour of the Respirations after Decerebration in the Cat. J. J. R. Macleod (*Trans. R. Soc. Can.*, 1919, Section V., 85-101).—After removal of the cerebral hemispheres cats may continue to breathe normally for several hours, or fail to respire adequately, or breathe normally for some time, but subsequently become hyperpnœic and succumb. It is tentatively suggested that the cause of hyperpnœa may be the acute acidosis produced by accumulation of lactic acid derived from the contracted musculature in decerebrate animals.—J. A. H.

301. Blutgasanalysen. VII. Der Einfluss von Bor, Aluminium und Lanthan auf Hämoglobin und Zelle. H. Straub and K. Meier (*Biochem. Zeit.*, 1920, **111,** 45-66).—If the CO_2 capacity of blood or hæmoglobin solutions is plotted against CO_2 tension there will be found a break in the curve, this break, representing a state where CO_2 is absorbed without any change in the acidity taking place; in other words, during the period corresponding to this break in the curve CO_2 is absorbed, but the H-ion concentration remains constant. Usually this point is near $P_H = 7{\cdot}0$. The authors find that various electrolytes and non-electrolytes shift the position of this break in the curve, and they think that two factors are at work: one which shifts the point to the alkaline, and the other which shifts it to the acid side. They call these principles (*a*) and (*b*). These principles, whatever they are, come into play in one and the same solution during dilution. For example, laked blood shows the break in the CO_2 curve at about $P_H = 7{\cdot}0$; addition of 0·015 molar boric acid shifts it to a point corresponding to $P_H = 7{\cdot}23$, and a maximum point is reached for the break at $P_H = 7{\cdot}33$. Further addition of boric acid shifts the break back towards the acid side, so that with 0·133 molar boric acid it is at $P_H = 6{\cdot}9$. It is a great pity that the diagrams are so cramped, as it is only with effort that they can be deciphered.—E. C. G.

302. Blutgasanalysen. VIII. Der Einfluss einiger Digitaliskörper auf die Ionendurchgängigkeit menschlicher Erythrocyten. H. Straub and K. Meier (*Biochem. Zeit.*, 1920, **111,** 67-82).—The authors, as noted in the previous abstract, make use of the "breaking-point" in the CO_2 absorption curve as an index of the effect of electrolytes. They think to have correlated the effect of ions to the position of elements in the periodic classification, etc. However this may be the CO_2 curves show bends or breaks which require explanation. In the case of laked blood the authors refer the bend in the curve to sudden discharge of the hæmoglobin, anyway without being too particular about words, to some change in the hæmoglobin in virtue of which it combines with more CO_2 without the acidity of the solution increasing. But now the authors describe further experiments with intact blood-cells, and they find the same bends in their curves, but they explain these as due to sudden changes in the permeability of the erythrocytes. But why two explanations? In the present communication the authors study the effect of members of the strophanthin group upon the permeability of red blood-cells, making use of the CO_2 capacity curves. They find that adding the drug so alters the conditions that a higher acidity is required to produce the sudden absorption of CO_2 represented by the break in the curve referred to. Digitalis thus acts like Ca and alkaline earths, and oppositely to K. These results the authors say support the pharmacological doctrine that digitalis and Ca stand in relationship to one another, and they give us a deeper (? clearer, E. C. G.) insight into the mechanism of digitalis action.—E. C. G.

303. Hæmato-Respiratory Functions—VII.-XI. H. W. Haggard and Y. Henderson (*J. Biol. Chem.*, 1920, **45,** 189, 199, 209, 215, 219-21).—Hæmoglobin plays a part in the transport of CO_2 by absorbing HCl from NaCl. The sodium bicarbonate of plasma is

zero at zero pressure of CO_2. Plasma of varying alkali content can be obtained from any blood according to the CO_2 pressure at which the plasma is separated. Hæmoglobin is the chief stabiliser of blood. The amount of HCl which has been absorbed by the corpuscles varies inversely with the alkali reserve of the blood. Too low a pressure of CO_2 produces a permanent change, so that the capacity of the blood to take up CO_2 is decreased. With defibrinated blood oxygen decreases the power of blood to absorb CO_2, but not with oxalated blood. Exposure of blood to air causes hæmolysis by loss of CO_2 with the production of the irreversible change mentioned above.—H. E. R.

304. The Carbon Dioxide Carriers of the Blood. D. D. Van Slyke (*Physiol. Reviews*, 1921, **1**, 141-75).—The chief CO_2 carrier of the blood is the hæmoglobin. Of the alkali furnished to neutralise the CO_2 that enters the venous blood, from 80 to 95%, sometimes possibly all, comes from the hæmoglobin. Of such alkali, the greater part is set free when oxyhæmoglobin is changed into reduced hæmoglobin. A smaller part of the alkali is furnished by unchanged hæmoglobin, itself an efficient buffer at blood reaction. The relatively slight remainder is furnished by the phosphate in the cells, the proteins in the plasma, and the bicarbonate. The hæmoglobin in the cell can increase the alkali content of the plasma by withdrawing Cl from the plasma NaCl, thus leaving the Na to form $NaHCO_3$. H_2CO_3 can enter the cells to combine with the alkali furnished by the hæmoglobin, thereby decreasing the H_2CO_3 of the plasma at the same time that the Cl shift increases its $NaHCO_3$. By means chiefly of the exchange of the CO_2 and HCl with the plasma, the cells are enabled to use their reserves of buffer alkali to maintain constancy of reaction in the plasma, although the hæmoglobin and phosphates do not leave the cells.—J. A. H.

305. The Carbon Dioxide Dissociation Curve and the Arterial and Venous Carbon Dioxide Tension of Human Blood in Health and Disease. J. J. Peters, Jr., and D. P. Barr (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18**, 5-9).—The normal limits of variation in height of the CO_2 dissociation curve at 37·5° C. were found to agree with those established by previous observers. Contrary to general opinion, the alveolar tension of CO_2 is not always the same as that of arterial blood. The arterial tension may be as much as 10 or 11 mm. Hg higher than the alveolar even in normal resting persons. In cardiac dyspnœa the difference between alveolar and arterial CO_2 tension was always much greater than normal, varying from 13 to 19 mm. Hg. In severe anæmia the dissociation curve is higher and more nearly horizontal than normal at CO_2 tensions that exist in the body, and the compensating effect of oxygen is greatly diminished because of the diminution of hæmoglobin. An empirical equation to correct the CO_2 tension of the arterial and venous blood for oxygen unsaturation is proposed.—D. H. de S.

306. The Influence of Oxygen in Expelling CO_2 from the Blood. Y. Henderson and H. W. Haggard (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 206-7).—Variations in oxygen tension influence the CO_2 capacity of freshly drawn dog's blood which has been defibrinated, but not of blood which has been oxalated.—D. H. de S.

307. Studies of the Distribution of Carbon Dioxide between Cells and Plasma. L. W. Smith, J. H. Means, and M. N. Woodwell (*J. Biol. Chem.*, 1921, **45**, 245-53).—The CO_2 content of whole blood and of plasma was estimated in blood from arteries and veins, and the relative volume of corpuscles was measured by means of the hæmatocrit. The venous blood contained more CO_2 than the arterial blood, but there is no increase in the plasma; therefore the increase is in the corpuscles.—H. E. R.

308. Über den Einfluss des Köhlensäuregehaltes der Inspirationsluft auf Atmung und Gaswechsel. I. Uzhofer (*Arch. f. Hygiene*, 1920, **89**, 223-36).—That increase of CO_2 in the inspired air increases the depth without necessarily affecting its frequency is an elementary piece of physiological knowledge, but is here apparently regarded as a new discovery.—W. D. H.

309. Respiratory Mechanism in Cardiac Dyspnœa. I. The Low Alveolar CO_2 of Cardiac Dyspnœa. II. The Effective Lung Volume in Cardiac Dyspnœa. III. The Effective Ventilation in Cardiac Dyspnœa. D. P. Barr and J. P. Peters, Jr. (*Amer. J. Physiol.*, 1920, **54**, 307-54).—The CO_2 content of the alveolar air is low in comparison with the CO_2 capacity of the blood. There is no evidence of increased volume of residual air; so that, since the "vital capacity" is diminished, the volume of air in the lungs available for exchange of gases is decreased. The maximum volume of tidal air attained in rebreathing is lower than normal. The bicarbonate content of the plasma gives no indication of the alveolar CO_2 content. The minute volume of effective or exchange air is increased during cardiac decompensation. The greater ventilation is required owing to the low concentration of CO_2 in the exchange air.—W. M. B.

310. Beitrag zur Kenntnis der Wirkung des Kohlenoxyds. M. Kochmann (*Biochem. Zeit.*, 1920, **111**, 39-44).—A short interesting account of experiments upon frogs, tadpoles, and isolated frog's hearts carried out with a view to testing the relative importance of CO, CO_2, and other constituents of coal gas in the production of poisoning. First, is CO more poisonous than any inert gas such as hydrogen? The answer is No. Admixture with CO_2 makes CO much more poisonous, and this explains why many workers have attributed to CO poisonous properties over and above those arising from its replacing oxygen in respiration. Frogs succumb in 20 minutes to CO containing 5 to 10% of CO_2, but in pure CO they resist for 2 hours, just as they do in pure hydrogen. (The frogs recover when returned to air.) A kymographic tracing is given which shows that the isolated frog's heart behaves similarly. Under conditions where pure CO has no effect a mixture of CO and CO_2 has a marked inhibitory action. In the case of coal gas, after the removal of CO_2 there is still a distinctly poisonous action, an action which is abolished by treatment of the coal gas with bromine, so that it would appear to be due to such constituents as acetylene. The bearing of all this on the question of coal-gas poisoning in man is clear, and interesting pharmacological questions are raised. Tht author does not think that the amount of CO_2 and acetylene present normally in coal gas is sufficient to make them aid in the production of poisoning. May not, however, the CO_2 produced in a badly ventilated bedroom be of first importance in aiding the production of poisoning by coal gas, if these facts are as the author states them?—E. C. G.

311. The Elimination of Carbon Monoxide. H. W. Haggard (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 205-6).—The normal rate of elimination in dogs gassed to 60 to 80% saturation of the hæmoglobin with CO was studied. If the animals survived, the blood was practically free of CO in from 2 to 3 hours. The inhalation of oxygen after the gassing approximately doubled the rate of elimination. Inhalations of 6% CO_2 in air increased the pulmonary ventilation, and diminished the period of elimination to one-half or less of the normal. Inhalations of oxygen with 6% CO_2 resulted in complete elimination of CO from the blood in from 15 to 20 minutes. With inhalations of CO_2 death from respiratory failure was prevented.—D. H. de S.

312. Variations in the Affinity of Hæmoglobin for Carbon Monoxide in Health and Disease. A. L. Prince (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 204-5).—A formula is given for finding the O_2: CO affinity ratio. The CO variations in the affinity ratio of all the bloods examined fell between 1: 254 and 1: 378, and these variations bore no relation to the hæmoglobin percentage of the blood nor to the age and condition of the subject.—D. H. de S.

313. Influence de la pression d'O_2 sur les oxydations produites par les tissus animaux et par les ferments oxydants. F. Battelli and L. Stern (*Compt. rend. des séances soc. phys. hist. nat. Genève*, 1920, **37**, 31-3).—In general the oxidation processes increase with increased oxygen pressure. Respiration experiments gave irregular results, but

the respiratory quotient decreases with increase of oxygen pressure. Oxygen pressures up to 4 atmospheres were used.—R. C. K.

314. The Gases in Human Arterial Blood in Certain Pathological Conditions. J. Meakins (*J. Pathol. and Bateriol.*, 1921, **24,** 79-90).—In asthma, chronic bronchitis, and emphysema administration of oxygen raised the oxygen saturation of the arterial blood except when emphysema was very advanced. In lobar pneumonia the increase of oxygen saturation was very pronounced.—C. L. E.

315. L'insuffisance respiratoire aux très hautes altitudes et sa correction par les injections sous-cutanées d'oxygène. R. Bayeux (*Compt. rend.*, 1921, **172,** 291-4).—When a man ascends from a low level to a high altitude the total respiratory exchange gradually diminishes. Subcutaneous injection of oxygen leads to increase of the respiratory exchange. The effect of such an injection may last 20 hours.—J. A. M.

316. Medical Studies in Aviation. Y. Henderson and colleagues (*J. Amer. Med. Assoc.*, 1918, **71,** 1382-1400).—This is a reprint of the work of Prof. Yandell Henderson and eight of his fellow-workers. It especially concerns the protection of flying-men against the effects of high altitudes and oxygen want. The special point of view will be gathered from other papers from the same source, and should be taken into account by those interested in this branch of applied physiology.—W. D. H.

317. Discrepancies in Blood-Oxygen Analyses by the Methods of Van Slyke and Henderson-Smith. A. H. Smith, J. A. Dawson, and B. Cohen (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 211-3).—The divergence between the results obtained by the two methods may represent a variation of 17 to 64%. Sources of error in the methods are indicated, but even when corrections are made for these the results do not agree. The authors are engaged in testing other factors that may be involved.—D. H. de S.

318. Au sujet de la présence d'urée dans la buée respiratoire. G. Battez and C. Dubois (*Compt. rend. soc. biol.*, 1920, **83,** 791-3).—No urea was found in the water condensed from the expired air of doubly nephrectomised dogs when care was taken to prevent admixture with nasal mucus.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

SUGAR AND DIABETES

319. Variations in Normal Blood-Sugars. S. Strouse (*Arch. int. Med.*, 1920, **26,** 751-8).—Efforts to change blood-sugar percentage in 5 normal persons by varying the water intake and excretion failed. Slight diurnal variations do occur, which are stated to depend on changes in the weather. The above paper is followed by 2 others by the same author (*ibid.*, 759, 768) on alimentary hyperglycæmia and renal glycosuria respectively, the titles of which are mentioned for those interested.—W. D. H.

320. Die Verteilung der Glucose zwischen Plasma und roten Blutkörperchen—IV. R. Ege (*Biochem. Zeit.*, 1920, **111,** 189-218).—The author considers Masings and Kozawa's conclusions unjustified, and concludes that our ideas about the changes in volume of blood-cells with changing osmotic conditions want complete revision.—E. C. G.

321. Chemical Pathology of the Blood in Severe Anæmias. A. W. Peters and A. S. Rubnitz (*Arch. int. Med.*, 1920, **26,** 561-9).—By micromethods described, the total solids of blood in pernicious and other forms of severe anæmia are found to be reduced. This is mainly due to reduction of corpuscles, and only in minor degree to that of plasma solids. The same is true for nitrogen; there is little or no decrease in plasma nitrogen; it may even rise slightly.—W. D. H.

322. The Relationship of High Blood-Sugar to Furunculosis. W. Thalhimer (*J. Amer. Med. Assoc.*, 1921, **76,** 295-8).—In a case of a boy who had a huge appetite for carbohydrate, the tendency to boils was regarded as possibly a pre-diabetic condition. The condition was cured by reducing the carbohydrate intake.—C. L. E.

323. Über osmotische Wirkungen intravenöser Zuckerinjektionen unter wechselnden Bedingungen—I. M. Bürger and E. Hagemann (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11,** 239-56).—Experiments on healthy men show that the effect of injections of sugar solutions (increased quantity of plasma and relatively diminished contents of protein) quickly disappears, and that preceding muscular work can paralyse this effect. The contrary reaction is observed in cases with dropsy. Such patients show, after the sugar injection, a decreased quantity of plasma, together with higher protein content. —H. W.

324. Sugar Tolerance. H. Maclean and O. L. V. de Wesselow (*Quart. J. Med.*, 1921, **14,** 105-19).—Urine testing being untrustworthy, reliance must be placed on blood-sugar estimations. Maclean describes his method in detail (Abstract No. 2033, Vol. IV., p. 327). Charts are given comparing the curve after glucose ingestion for normal and diabetic persons. In the latter the hyperglycæmia is greater and more persistent; this is due to the inefficiency of storage, especially in the liver. The details of the paper demand careful study by clinical observers.—W. D. H.

325. Relation of the Alkali Reserve of the Blood to Glycosuria and Hyperglycæmia in Pancreatic Diabetes. B. M. Hendrix and Caroline Y. Crouter (*J. Biol. Chem.*, 1920, **45,** 51-5).—A decrease in alkali reserve is not simultaneous with hyperglycæmia and glycosuria in pancreatectomised dogs. Acidosis occurs late in pancreatic diabetes.—H. E. R.

326. The Smallest Amounts of Substances of the Phlorhizin Group which are Capable of Producing Glycosuria. S. Fromm (*Beitr. Phys. (Cremer)*, **1,** 287-312; *Zentr. Biochem. Biophys.*, 1917, **19,** 256-7).—The theories of phlorhizin diabetes are classified as follows: (1) The Mering elimination theory, (2) the primary extrarenal theory, (3) the theory of primary renal sugar production, (4) the vehicle theory. The vehicle theory assumes that phlorhizin is decomposed in the kidneys into phloretin and dextrose (the latter being eliminated), and that phloretin again combines with the dextrose present in the blood, the phlorhizin so produced again undergoing cleavage in the kidneys with excretion of the new amount of dextrose thus liberated. If this theory is correct, phloretin, when administered in amounts equivalent to the doses of phlorhizin employed, should have the same effect as the latter in producing glycosuria, especially when small doses are used. The smallest amount of phlorhizin capable of causing sugar to appear in the urine of a 6 to 8 kg. dog was found to be 0·001 g. According to the vehicle theory, the amount of phloretin (0·63 mg.) equivalent to 1 mg. of phlorhizin should likewise cause excretion of sugar; the active threshold value for phloretin was, however, found to be 0·25 g. The threshold values for phlorhizin glucuronic acid and phlorin were 0·1 g. and 0·35 g. respectively. The same dog was used throughout these experiments.—W. D. H. (*Chem. Abstr.*).

327. Diabète et glycémie. H. Bierry and F. Rathery (*Compt. rend.*, 1921, **172,** 244-6).—Taking cases of diabetes in which the sugar can be made to disappear from the urine by a strict dietary, it is possible to discover for each patient the "glycæmic index of tolerance." The index is constant for each individual. The procedure is as follows: The sugar content of the blood is ascertained while glycosuria is present. The restricted diet is then adopted, and is continued for 8 days, by which time the urine is free from glucose. At this stage a second estimation of the blood-sugar is made. Gradually increasing amounts of carbohydrate are then added to the dietary till traces of sugar appear in the urine. The carbohydrate is thereupon slightly reduced, and the urine becomes sugar-free. A third estimation of the sugar of the blood is then made. This gives the glycæmic index of tolerance for the particular patient examined. For clinical purposes the first and second estimations of the sugar of the blood need not necessarily be made. The authors find that the blood-sugar is partly in the form of free sugar and partly combined with protein.—J. A. M.

328. Über die Beziehungen zwischen Hyperglycämie und Glycosurie beim experimentellen Adrenalindiabetes. F. Hildebrandt (*Arch. exp. Path. Pharm.*, 1920, **88**, 80-112).—Experiments on rabbits. The degree of hyperglycæmia varies, and the reason is that the amount of glycogen in liver and other carbohydrate depots is different to start with. There is no evidence that the kidney becomes altered in its permeability to sugar. The amount of sugar in the urine depends on the amount of diuresis, and is proportional to the amount in the blood.—W. D. H.

329. A Difference between the Mechanism of Hyperglycæmia Production by Ether and by Chloroform. E. L. Ross and L. H. Davis (*Amer. J. Physiol.*, 1921, **54**, 474-8).—The hyperglycæmia produced by ether is not affected by an ether anæsthesia of the previous day. Whereas, if chloroform had been given the previous day, the glycæmia produced by ether is reduced. This is attributable to the injury to the liver cells produced by chloroform. The hyperglycæmia of chloroform anæsthesia is not directly due to this hepatic effect, but, like that of ether, is due to the depressant action on the internal secretion of the pancreas.—W. M. B.

330. Fat Metabolism in Diabetes. N. F. Blau and S. T. Nicholson (*Arch. int. Med.*, 1920, **26**, 738-50).—Analyses from 26 cases of blood-fat and blood-sugar are presented, and grouped into categories. The lipoid value is lowest in a negative carbohydrate balance, showing that the diabetic organism can utilise fats more easily in the presence of large amounts of sugar, and that in "sugar-free" patients there must be a great strain on the fat-burning mechanism if large amounts of fat are given in the food. Evidence of this may often be seen in the high values for plasma cholesterol.—W. D. H.

331. Le glycogène dans le diabète par extirpation du pancreas. N. Paulesco (*Compt. rend. soc. de biol.*, 1920, **83**, 562-5).—Total ablation of the pancreas (? animal) was carried out; at the same time a lobe of the liver was removed to determine the quantity of glycogen at the beginning of the experiment, and finally the autopsies were performed. In one set of experiments the animal was starved; in the other it was fed on various sugars. The conclusion is that after total ablation of the pancreas the ability of the liver to retain glycogen is considerably reduced, but not annihilated. The same may be said for muscle. The power of the myocardium to fix glycogen remains normal, and persists until death, 16 days after the operation. The glycogenic incapacity is relative—a contingent phenomenon—and not the cause of diabetes.—S. V. (*Endocrin.*).

332. Diabetes—II. (7) Effect of Cold. (8) Influence of Age. (9) Pregnancy. F. M. Allen (*Amer. J. Physiol.*, 1921, **54**, 425, 439, 451-9).—(7) Cold lowers the resistance, and in some dogs with pancreatic diabetes has a bad influence, but the effect is small, and any influence of climate on human diabetes must be very slight. (8) Observations on senile dogs failed to show any difference from what obtains in pancreatic diabetes in ordinary dogs. Further, there was no specific tendencies to rapidity of downward progress or acidosis in puppies. In one case the onset of symptoms was much delayed, and it is possible that childhood infections injuring the pancreas may be responsible for the onset of diabetes later on. (9) No influence of the sex glands on diabetes was demonstrable by extirpation experiments, nor do changes in the pancreas result from pregnancy and lactation, nor does any appreciable quantity of internal pancreatic secretion pass from fœtus to mother. Carbohydrate assimilation falls during pregnancy, but the effect is slight and is regarded as a "toxic" manifestation. It is possible that this toxic factor is greater in women than in dogs.—W. D. H.

333. High Fat Diet in Diabetes. L. H. Newburgh and P. L. Marsh (*Arch. int. Med.*, 1920, **26**, 647-62).—The energy intake must be kept up, and favourable results in 73 cases of diabetes are recorded in which this was done by a high fat diet.—W. D. H.

334. Kriegskost und Diabetes. C. v. Noorden (*Med. Klin.*, 1921, Nr. 1, 5-7).—The advantageous influence of nutrition during the war on the metabolism of many

diabetic patients was caused by the diminution of protein and by the cessation of over-nutrition.—H. W.

335. The Kidney Function in Diabetes Mellitus. H. Schirokauer (*Deutsch. med. Woch.*, 1920, **46,** 711-3).—In nephritis glycæmia can exist without glycosuria. The possibility of the influence of an internal secretion of the kidney is considered which prevents sugar accumulating in the tissues in such conditions.—W. D. H.

336. Die Wirkung der Muskelarbeit auf Blut und Harnzucker beim Diabetiker. M. Bürger (*Arch. exp. Path. Pharm.*, 1920, **87,** 233-92).—The fluctuation of the content of sugar in the plasma, owing to muscular work, is much greater in diabetes than in health. Hyperglycæmia due to work, depends upon the glycogen content of the liver, on the character of the diabetes, and on the excitability of the nervous system. Glycosuria is relatively independent of the content of sugar in the plasma.—H. W.

337. Arrêt de la glycolyse par un mélange de fluorure de sodium et de phosphate monopotassique. L. Ambard (*Bull. soc. chim. biol.*, 1920, **2,** 201-3).—The author advises adding 15 gm. of a mixture of 1 part of sodium fluoride and 2 parts of acid potassium phosphate to each litre of blood.—J. C. D.

ALIMENTARY CANAL

338. Effects of Pilocarpine upon Salivary Fistula Dogs before and after Coli Injection. H. G. Barbour and B. P. Freedman (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 208-9).—The dogs showed a gradually increasing sensitivity to pilocarpine as the result of repeated doses. After 6 to 8 injections the results became more constant. When pilocarpine was injected at the height of the fever following an injection of coli vaccine, the secretion curves showed a slow onset and a much diminished maximum as well as total secretion. The saliva was of a much thicker consistency than normal.—D. H. de S.

339. Sull' attivita secretiva della ghiandola sottomascellare del cane irrorata artificialmente. G. Quagliariello (*Atti R. Acc. med. chir. Napoli.*, 1920, **74,** reprint, pp. 7).—Demoor stated that a trace of the blood of an animal of the same species as that of the one experimented upon must be present in an artificially circulating fluid to maintain the function of the submaxillary gland. This led the present author to repeat Demoor's experiments, taking care at the same time that no blood could become mixed with the physiological solution made to circulate through the submaxillary glands of the dogs used. The artery distributed to the submaxillary gland was isolated. A fistula of Wharton's duct was made and the chorda tympani isolated, and then a cannula was introduced into the submaxillary artery whilst the corresponding veins were freely opened. As circulating fluid, oxygenated Ringer's solution at 39° was used at a pressure of 120 to 150 mm. Hg. The chorda tympani was subjected to faradic stimulation for 15 seconds every 10 minutes. In contradiction to Demoor's conclusions the gland did not show any change in its secretory activity during the first 3 hours of artificial circulation. In the following 3, however, the secretion and velocity of circulation steadily diminished, this being apparently due to œdema of the gland, the causes of which the author is still investigating.—C. d. F.

340. Digestion of the Œsophagus as a Cause of Post-Operative Hæmatemesis. J. H. Pringle and J. H. Teacher (*J. Path. and Bact.*, 1921, **24,** 119-20).—The lesions are produced by gastric juice which has escaped from the stomach and lain some time in the œsophagus; they vary from a superficial erosion of the mucous membrane in some cases to perforation or even maceration of the lower third of the gullet in others. The condition occurs in medical and surgical cases.—W. E. G.

341. Über die Sensibilität des Verdauungstraktus beim Menschen. L. Fischl (*Münch. med. Woch.*, 1920, **67,** 604).—The œsophagus is supplied with afferent nerves,

which are sensory only for touch and pain; only in its cardiac end does it show any sensibility to heat or cold as well. In a patient with a gastric fistula the mucous membrane of the stomach was found to be sensitive to all four stimuli. In the large intestine sensory nerves are absent from both mucous and serous coats, except in the neighbourhood of the anus.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

342. Distribution of Gastric Glands in Man and other Animals. Y. Miyagawa (*J. Anat.*, 1920, **55,** 56-67).—The area of the pyloric glands can be determined by describing a circle with its centre at the pylorus and its radius equal to a proportion of the length of the lesser curvature (5/10 guinea-pig, 7/10 rabbit, 4/10 cat, 3/10 adult man, 4/10 infant). The transitional area between them and the fundus glands is 1 cm. wide in man; but here the cells of the 2 kinds are never found intermingled in the same tubule. Oxyntic cells occur in both pyloric and fundus glands, and are especially numerous in human pyloric glands, but are most abundant in the fundus glands, particularly those near the lesser curvature. The cardiac glands are in groups of 2 to 4 in a narrow band around the cardiac orifice. Numerous mucous glands and a few crypts of Lieberkühn are intermixed with the others.—W. D. H.

343. Zur Frage der Beeinflussung der secretorischen Magenfunction durch äussere, allgemeine und locale Wärme-einwirkungen. A. Fischer (*Schweiz. med. Woch.*, 1920, Nr. 50, 1139-42).—General application of warmth causes reduction of the gastric juice. A reduction of the HCl content also occurs, but is regarded as less important. Corresponding but less intense effects are produced by the local application of warmth.—H. W.

344. The Motility of the Antrum and the Relation of Rhythmic Activity of the Pyloric Sphincter to that of the Antrum. H. Wheelon and J. E. Thomas (*J. Lab. and Clin. Med.*, 1920, **6,** 124-43).—Direct, graphic, and radiographic observations show that contractions and relaxations of the antrum and pyloric sphincters of the dog follow each other in a regular sequence at the rate of 3 to 5 per minute, and are maintained for hours. Rhythmical motility is best obtained when the stomach contains food. The motility of these two parts may be considered as constituting a cycle of the pars pylorica. The sphincter is open during the greater part of the antral contraction, and actively closed while the antrum is relaxing. The activities of the pyloric sphincter, at least in great part, are dependent upon the activities of the antrum. If acid exercises pyloric control, it must act also in a similar way upon the antrum and the stomach as a whole.—D. H. de S.

345. Rhythmicity of the Pyloric Syhincter. H. Wheelon and J. E. Thomas (*Amer. J. Physiol.*, 1921, **54,** 460-73).—The pyloric sphincter of the dog shows spontaneous rhythmic contractions, superposed on slower tonic changes. These contractions and relaxations are related to the motility of the stomach, and play a part in controlling the passage of chyme into the duodenum.—W. M. B.

346. Reflektorische Bauchmuskelerschlaffung bei Füllung des Magendarmkanals. O. Bruns (*Münch. med. Woch.*, 1920, **67,** 654-6).—Even during the rapid filling or emptying of the stomach the intraperitoneal pressure shows no variations. This is due to a reflex adjustment of tone of the abdominal muscles, the afferent path leading from the inner wall of the stomach through the gastric plexus, semilunar ganglion, and the splanchnics.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

347. Über den Einfluss von Temperaturen auf Fermente, besonders von Lab und Pepsin. A. König (*Biochem. Zeit.*, 1920, **110,** 266-86).—The author comes to no very general conclusion, but he notes, among other things, that pepsin and rennet behave differently toward temperature. It does not appear, however, that he wishes to lay any special stress on this point, although it is probably the point which would interest most people if it really means that the ferments themselves have different temperature

coefficients. In these experiments, however, the pepsin and rennet are from quite different sources, and the author has made no attempt to arrange comparable conditions, so that doubtless no conclusions as to the identity or dissimilarity of the ferments could be drawn.—E. C. G.

348. Die Bedeutung der Magensalzsäure. L. Michaelis (*Biochem. Zeit.*, 1920, **111,** 105-7 ; compare Abstract No. 1467, Vol. V., p. 236).—While agreeing that actually the optimum conditions for swelling of protein and pepsin action are reached at the same concentration of HCl, the author does not think that Traube (Abstract No. 2781, Vol. IV., p. 451) is justified in considering the former process as an essential forerunner of the latter; indeed, some acids which activate peptic digestion actually make the protein mass shrink. The author reproves Traube, who persists in the old acidity titration instead of determining the P_H.—E. C. G.

349. Analysis of Gastric Contents. S. W. Cole and W. J. Adie (*Lancet*, 1921, i., 423-6).—Notes on methods, with suggested modifications of some.—W. D. H.

350. Agents for Reducing the Hydrochloric Acid in Gastric Ulcer. G. Kelling (*Arch. Verdauungskrankh.*, 1920, **26,** 250).—The view is held that HCl formation depends on electrolytic dissociation and osmotic processes, and that it is increased in ulcer of the stomach. Dietary regulation is regarded as the best means of remedying this, and extensive clinical regulations are laid down in reference both to diet and drugs.—W. D. H. (*Chem. Abstr.*).

351. Ricerche chimico-biologische sull' acido lattico del succo gastrico. U. Masucci and P. Saccardi (*Folia med.*, 1920, **6,** 97-100, 127-32).—By the use of the resorcin test (details recorded) the authors find that the lactic acid of the gastric contents is not the product of a ferment action on any constituent of the food, but is formed in the cells of the gastric mucous membrane under the influence of the vagus.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

352. Hydrogen-Ion Concentration of the Contents of the Small Intestine. J. F. McClendon, F. S. Bissell, E. R. Lowe, and P. F. Meyer (*J. Amer. Med. Assoc.*, 1920, **75,** 1638-4).—The contents withdrawn by the Einhorn duodenal tube had a P_H from 4·1 to 6·5, and remained acid after removal of CO_2.—C. L. E.

353. Relationships between the Peptidolytic Activity of Intestinal Erepsin and the Chemical Constitution of the Substrate. A. Clementi (*Atti R. Accad. Lincei*, 1920, [v.], **29,** ii., 327-9).—By means of formaldehyde titration the author investigated the action of intestinal erepsin from the dog or pig on cholylglycine, benzoylglycine, bromo-*iso*hexoylglycine, and glycine anhydride. They are not affected. These results, in conjunction with the behaviour of guanidylglycylglycine, show that suppression or absence or partial substitution of the free aminic group of the molecule of a polypeptide or similar compound may result in marked resistance of the CO·NH group to the hydrolysing action of erepsin.—W. D. H. (*J. C. Soc.*).

354. Über die Insuffizienz der Valvula ileocoecalis. B. Hannes (*Münch. med. Woch.*, 1920, **67,** 745-6).—Experiments to determine the behaviour of the ileo-cæcal valve. Cats and dogs with a fistula in the lower ileum were used. Coloured fluids were administered per rectum. In animals starved for 2 days, this fluid at once came out of the fistula. In animals fed, no fluid came out. The use of a dog with both a duodenal and an ileal fistula enabled the author to demonstrate that the closure of the valve, in animals which were fed, was not due to the presence of food in the small intestine, but to the psychical reflexes aroused by the taking of food.—J. H. B.

355. Trypsin in Fæces. K. I. Krieger (*Arch. Verdauungskrankh.*, 1920, **26,** 351-64).—Testing for trypsin after filtration through a Berkefeld filter is of doubtful value. Trypsin may be absorbed in the intestine; it may be retained in the filter, or it may be absent, and yet tryptic enzymes of bacterial origin be present. More reliance as to

the presence or absence of pancreatic juice should be placed on testing for amylase.—W. D. H. (*Chem. Abstr.*).

356. Lymphocytosis and Pepsin Formation. A. J. Pavlovsky (*Semana med.*, 1920, **27,** 398-405; Spanish).—By using a dog with a gastric fistula it is shown that injection of emulsion of pancreas leads to a lymphocytosis and to an increase of over 50% in the pepsin content of the gastric juice. Injection of spinal cord emulsion produces a polynuclear leucocytosis, but produces no effect on leucocytes or gastric juice. The parallel variations in the number of lymphocytes and the activity of the gastric juice are explained by the theory that the proteolytic enzyme of the lymphocytes is liberated into the blood, and thence secreted by the gastric glands.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

357. Zur Kenntnis der Verdauungsleukocytose. E. F. Müller (*Zeit. f. exp. Pathol. u. Ther.*, 1920, **21,** 136-40).—The increased production of leucocytes during the digestion of proteins is a protective reaction on the part of the bone-marrow to the stimulus of breakdown products formed in the cells of the alimentary canal.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

358. Resistance of Hepatic Tissues to Local Anæmia. L. R. Chandler (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 23-4).—The almost total anæmia produced by temporary ligature of the hepatic artery and portal vein in Eck fistula dogs, for periods as long as 12 hours, does not cause necrosis of the hepatic parenchyma. This power of the hepatic cells to resist local anæmia is considered probably to account in large measure for the infrequency of infarcts in the liver.—D. H. de S.

359. Über functionelle Leberzellstrukturen. I. Die Leberzelle von Salamandra maculata während des Zustandes der guten Ernährung und des Hungers. Die Einwirkung von Fütterung und von Beförderung der Gallenabsonderung bei Hungertieren. W. Berg (*Arch. f. mikr. Anat.*, 1920, **94,** 518-67).—In the livers of well-fed animals numerous fine droplets, giving the microchemical reactions of proteins, were observed in the cytoplasm. The delicate plastosomes were quite distinct from these. The author's experiments on the fixation of various protein substances in gel form lead him to believe that these fine granules consist of partially hydrolysed protein. The plastosomes appear to have no connection with the formation or disappearance of the granules. By administration of cholagogues the number of plastosomes was greatly reduced.—C. L. E. (*Ber. ü. d. ges. Physiol.*).

360. Ricerche sperimentali sulle modificazioni del tessuto epatico in seguito all' asportazioni della milza. L. Silvestrini (*Arch. ital. di chir.*, 1920, **2,** 165).—No enlargement of lymphatics nor formation of accessory spleens was seen. The liver hypertrophies slightly. Eight days after splenectomy development of lymphocytes was apparent; this increased and invaded the entire interlobular connective tissue, and appeared in the lobules in small circular groups among the hepatic cells. From the sixth to the eighth month new-formed bloodvessels and connective tissue could be seen within the nodules, leading to formation of true lymphoid tissue. At a later stage red corpuscles, pigment, and degenerated polymorphs could be detected. These nodules represent partial splenisation of the liver, whose functional integrity is uninfluenced.—J. A. H. (*Med. Sci.*).

361. Beiträge zur Kenntnis des Verschlusses im Pfortaderstamm und der Vena lienalis. Kavernöse Umwandlung der Vena portae und chronisches Ulcus duodeni. F. Kaspar (*Deutch. Zeitsch. f. Chir.*, 1920, **156,** 1).—Obstruction of the portal vein causes dilatation of tributaries, producing cavernous-like tissue in the gastro-hepatic omentum. Obstruction tends to atrophy of the liver.—J. A. H. (*Med. Sci.*).

362. Die überlebende künstlich durchströmte Leber im histologischen Bild. E. v. Skramlik and T. Hünermann (*Zeit. f. d. ges. exp. Med.*, 1920, **11,** 348-66).—Ringer's,

solution causes damage in the protoplasm of the liver cells (formation of vacuoles, turbid swelling, œdema). Perfusion with cobra venom causes a total destruction of the endothelium of the capillaries. If the liver is perfused with an amboceptor, together with the erythrocytes belonging to it, these blood-corpuscles disappear after some time from the circulating fluid. This is due to agglutination of the corpuscles in the capillaries. The Kupfer cells showed extensive phagocytosis of red corpuscles.—H. W.

363. The Concentrating Activity of the Gall-Bladder. P. Rous and P. D. McMaster (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 215-6).—The normal gall-bladder of the dog can concentrate bile with very great rapidity.—D. H. de S.

364. I. Le rôle du suc intestinal dans la réproduction expérimentale de la pancréatite hémorragique avec stéatonécrose. II. Réproduction expérimentale de la pancréatite hémorragique avec stéatonécrose et du pseudo-cyste pancréatique par l'injection de sels de calcium dans le canal de Wirsung. L. Binet and P. Brocq (*Compt. rend. soc. biol.*, 1920, **83,** 340-1, 341-2).—The authors show that injection of intestinal juice containing enterokinase into the duct of Wirsung produces pancreatitis hæmorrhagica with steatonecrosis. Injection of 3 to 7 c.c. of sterilised 2% $CaCl_2$ solution produces a similar result, while the injection of as much as 20 c.c. of physiological NaCl solution is without effect. The $CaCl_2$ appears to influence the activation of trypsinogen.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

FOOD AND DIET

365. Brown and White Sugar. Marion C. Soar (*Lancet*, 1921, i., 241).—The adulterations found in brown sugar are only those due to refinement not being carried so far as is the case with white sugar. They are negligible from the cookery and dietetic standpoints.—W. D. H.

366. Digestibility of Hydrogenated Oils. A. D. Holmes and H. J. Deuel, Jr. (*Amer. J. Physiol.*, 1921, **54,** 479-88).—Experiments on young men are recorded which show that hardened vegetable oils (cottonseed, peanut, and corn) produce no digestive disturbances, and are as well utilised as natural fats of corresponding melting-points. (Compare Abstract No. 578, Vol. V., p. 90.)—W. D. H.

367. Kid, Rabbit, Horse, and Seal Meats as Food. A. D. Holmes and H. J. Deuel, Jr. (*J. Ind. Eng. Chem.*, 1920, **12,** 957-9).—The meats of kid, rabbit, horse, and seal are discussed and analyses given. The digestibility of the protein of these four kinds was essentially the same as that of other and better-known meats.—W. D. H. (*Chem. Abstr.*).

368. Growth on Diets Poor in True Fats. T. B. Osborne and L. B. Mendel (*J. Biol. Chem.*, 1920, **45,** 145-52).—Feeding experiments on rats in which diets containing very small amounts of true fats, but otherwise adequate, were used to make it clear that if true fats are essential for nutrition during growth, the minimum necessary must be exceedingly small. This confirms the results recently recorded by Drummond (Abstract No. 3490, Vol. V., p. 554).—J. C. D.

369. Observations on Rickets. H. M. M. Mackay (*Brit. Med. J.*, 1920, ii., 929-32).—The observations indicate that rickets is a dietetic disease, and commonly develops in children receiving insufficient fat and too much carbohydrate in the food, and that it shows itself most commonly among those who have been bottle-fed. Fat in the form of cod-liver oil, butter, or cottonseed oil does not seem to exert any specific curative effect; in cases where its administration was associated with improvement there were other factors at work. A deficient absorption of the fat-soluble vitamin A appears to account for the picture in cœliac disease. It is argued that, if this be so, some other

factor, and not a deficiency of vitamin A alone, must be concerned in the production of rickets.—D. H. de S.

370. Dietaries of Infants in Relation to the Development of Rickets. A. F. Hess and L. J. Unger (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 220-1).—The food which almost regularly led to definite rickets was a " protein milk " prepared by precipitating buttermilk by heat. The preparation contained about 3·3% protein, 2·5% fat, and 6·6% carbohydrate. Its ash was about 0·44%, of which the calcium and phosphorus stood about midway between that of human milk and cow's milk; its sodium content was even higher than that of the latter. Its fat-soluble vitamin content was high, its water-soluble vitamin content was low.—D. H. de S.

371. The Diet of Well-to-Do Children. R. McCarrison (*Lancet*, 1921, i., 348).—It is not only the poor who are liable to deficiency disease, but children generally, even those on a diet which is quantitatively sufficient but qualitatively wrong, may also be sufferers. Diet is ill-balanced from a threefold point of view: (1) Insufficient vitamin supply; (2) disproportionate richness in carbohydrate; and (3) an insufficient supply of fresh fruit and vegetables, and use of superheated milk, which *inter alia* causes the salts, especially Ca salts, to be diminished.—W. D. H.

372. The Effect of Certain Dietary Deficiencies on the Suprarenal Glands. C. H. Kellaway (*Proc. Roy. Soc.*, 1921, **92B,** 6-27).—This work was carried out to throw light on McCarrison's observations concerning the increase in size and in content of adrenaline of the suprarenals of pigeons fed on polished rice. This was confirmed; the changes are prevented by the administration of yeast with the diet. An attempt was made to explain the enlargement of the adrenals as being due partly to congestion and œdema of the gland tissues, and partly to the storage in the cortex of the gland of lipoids set free by the breaking down of body tissues, which occurs in birds fed on diets deficient in vitamin B. The investigation of the cholesterol content of the adrenals did not support this theory of lipoid storage. The increased residual content of adrenaline was attributed to diminished output of adrenaline as a result of the greatly lowered metabolism. The histological appearances of the glands suggested obstruction of the venous outflow from the medulla by cortical hypertrophy as an additional cause. Œdema in birds fed on deficient diets was of infrequent occurrence, and could not be produced by the daily administration of large doses of adrenaline. It does not appear to be causally related to increased output of adrenaline. This view is in harmony with the more recently expressed views of McCarrison.—W. D. H.

373. Principal Fodders, including the Small Bamboo (Dendrocalamus strictus), in the Central Provinces and Berar. D. Clouston and F. J. Flymen (*Agr. J. India*, 1920, **15,** 380-5).—The feeding value of grasses from these parts is low. Egyptian clover and the small bamboo show much promise for adoption on a large scale. Analyses are given. The dry bamboo leaves contain nearly 4 times as much protein as do the common grasses. The proportion of indigestible fibre is greater in grasses than in bamboo leaves The nutritive value of bamboo leaves appears to be equal to grasses, while the yield per acre (20 tons) is much greater. The seed of the bamboo is a good food grain.—W. D. H. (*Chem. Abstr.*).

374. Straw prepared by Beckmann's Method. H. Wagner and G. Schöler (*Landw. Ztg. Fühlings*, 1919, **68,** 228-34).—2% lye was used to hydrolyse the straw. The process was conducted at ordinary temperature, and was completed when the nodes could be easily crushed between the fingers. The digested product, after being carefully washed free of all alkali, was given to sheep, and found to be a very serviceable fodder either wet or dried.—W. D. H. (*Chem. Abstr.*).

375. High Protein and High Energy Rations in Cows. W. B. Ellet and C. W. Holdaway (*Virginia Agr. Exp. Stat. Tech. Bull.*, 1920, **20,** 3-16).—Two sets of dairy

cows were fed respectively on diets containing excess of energy food and excess of protein. The former digested their food badly, became thin, and gave little milk. The second batch thrived, and apparently could form milk fat either from protein or carbohydrate.—W. D. H. (*Chem. Abstr.*).

376. Cattle Feeding with the By-Products of the Erytrean Corozo Nut. Beltrami (*L'italia agricola*, 1919, **56,** 51-3).—The by-product from the manufacture of buttons from this nut (*Hyphæne thebaica*) is a white, light, odourless meal. Feeding experiments showed it to be of good food value and digestibility. Its analysis is set out.—W. D. H. (*Chem. Abstr.*).

377. Influence of Dry versus Fresh Green Plant Tissue on Calcium Assimilation. E. B. Hart, H. Steenbock, and C. A. Hoppert (*Science*, 1920, **52,** 318).—Experiments with cow and goat showed that milking animals receiving grains and dry oat straw as roughage are brought into a decided negative Ca balance. A striking feature was the large amount of fæcal Ca, indicating a failure in Ca assimilation. With milking goats fed on the above-mentioned ration, a negative balance of 1·6 to 2·3 g. of CaO per day was observed, but when the dry straw was replaced by an equivalent in dry matter of fresh *green* material the negative balance was 0·6 g. per day. As the intake was only 8 to 9 g. of CaO per day, a positive balance was not expected. Apparently there is something in the green food that affects Ca assimilation, and therefore affects growth, milk, and egg production.—W. D. H. (*Chem. Abstr.*).

378. Milk Substitutes for Feeding Calves. R. E. Caldwell (*J. Dairy Sci.*, 1919, **2,** 312-29; *Exp. Stat. Rec.*, 1920, **42,** 471).—Various flours and meals with alfalfa and dried blood were given to calves, with good results. Full details, chemical and metabolic, are set out.—W. D. H. (*Chem. Abstr.*).

379. Effect of Grain Rations on the Growth of White Leghorn Chicks and their Egg Production. G. D. Buckner, A. M. Peter, R. H. Wilkins, and J. J. Hooper (Kentucky Agr. Expt. Sta., 1920, *Bull.* **220**).—The proteins of rice, oats, barley, hominy, and gluten flour are inefficient in promoting normal growth, and apparently fail to promote the normal sexual development of a chick. Skim milk seems to supply some factor other than lysine, the lack of which seems to limit the nutritive power of the proteins in the grain administered. Skim milk given to chicks receiving grain and beef scrap does not appreciably enhance the growth or subsequent egg production.—W. D. H. (*Chem. Abstr.*).

VITAMINS

380. Beitrage zu den biologischen Wirkungen der akzessorischen Nährstoffe. E. Freudenberg and P. Gyorgy (*Münch. med. Woch.*, 1920, **67,** 1061-2).—The authors consider that the presence of accessory food factors can be demonstrated by their power to increase oxygen consumption, and that such demonstrations obviate the necessity of carrying out long feeding experiments. They study the oxygen consumption of the intestinal cells of a calf in the whey of cow's milk. If all fat droplets are removed the oxygen usage is very low. If cream, for instance, is added, it at once becomes high.—J. H. B.

381. Équilibre azoté et hydrates de carbone de la ration alimentaire. A. Desgrez and H. Bierry (*Compt. rend.*, 1920, **171,** 1393-6).—Rats were fed on a diet of water, salts, egg-white, fat, and sugar, and free from vitamins. Nitrogenous equilibrium could be maintained for 20 to 25 days, provided the amount of sugar reached a certain minimum. If the quantity of sugar was reduced below this point, loss of nitrogen occurred. After 20 or 25 days the effects due to absence of vitamins appeared.—J. A. M.

382. Die neuen Ernährungstheorien. III. Avitaminosen, Vitamine, und Bakterien. R. Lecoq (*Bull. sciences pharmacol.*, 1920, **27,** 255-69).—A general account of the subject, concluding with a theory of the circulation of vitamins. These are formed by bacteria in the soil, and assimilated by plants which are eaten by animals. In carnivores the source is the lower organisms, the intestinal flora.—C. L. E. (*Ber. ü. d. ges. Physiol.*).

383. Vitamins and Enzymatic Action. R. Thiébaut (*La presse méd.*, 1919, **27,** 795-6).—The theory is advanced that vitamins are indispensable to the action of enzymes in cell metabolism on the supposition that such action depends on the presence of electrons on the surface of colloidal substances. Thus the absence of vitamins A and B might cause a disintegration of the colloidal substance, and change the distribution of the electrons necessary for enzymatic action.—W. D. H. (*Chem. Abstr.*).

384. Vitamin Requirements of Rats. C. Funk and H. E. Dubin (*Science*, 1920, **52,** 447-8).—Various diets in which the constituents were varied were tried on rats. The principal new point brought out is that high protein (meat) diet lessens the necessity for the addition of vitamin B from yeast in order to prevent beri-beri.—W. D. H. (*Chem. Abstr.*).

384a. The Vitamin Content of Honey and Honeycomb. P. B. Hawk, C. A. Smith, and O. Bergeim (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 70-1).—The addition of strained honey or comb honey to a diet lacking water-soluble vitamin B caused hardly any gain in the weight of rats. Similar experiments on the addition of strained honey to diets deficient in fat-soluble vitamin A showed almost similar failure of growth. The addition of comb honey, however, brought about cessation of decline and distinct gains in weight. The addition of honey to the diets of guinea-pigs did not prevent or appreciably delay the development of scurvy in these animals.—D. H. de S.

385. Quantitative and Qualitative Test for Anti-Beriberi Vitamin. C. Funk and H. E. Dubin (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 175-7).—The test is based on the finding of other workers that vitamin can be measured by growth of yeast cells. Yeast cells are grown in the presence of the vitamin; the suspension is then centrifuged, and the height of the column of cells in the tube is measured, and compared with that of the column of cells similarly obtained from a yeast culture to which no vitamin was added. The test gave positive results with the vitamin fraction from yeast, and with thyroid and pituitary extracts; it gave negative results with polished rice, pilocarpine, and a number of other substances.—D. H. de S.

386. Vitamin Measurement. W. H. Eddy and H. C. Stevenson (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 218-20).—The method of vitamin measurement has already been described (see Abstracts Nos. 1507 and 2281, Vol. V., pp. 240 and 361). Results are now given which the authors consider indicate the specificity of the test for vitamin B.—D. H. de S.

387. Sulle sostanze dell' urina che spiegano azione di vitamine. Curatolo (*Il policlinico*, Sez. Med., 1, xi., 20).—In pigeons suffering from experimental polyneuritis the administration of 5 c.c. of rabbit's urine *per os* produced cure of the condition; the same holds if the urine is obtained from a starved rabbit. The effect is not due to the inorganic salts, and the authors doubt whether vitamins are specific (see also Muckenfuss, Abstract No. 150, Vol. V., p. 28).—W. D. H. (*Arch. méd. belges*).

388. Activity of Fat-Soluble Vitamin in Butter and Cod-Liver Oil. S. S. Zilva, P. D. Giessen, and M. Miura (*Lancet*, 1921, i., 323).—The superiority of cod-liver oil over other fats in cases of rickets and malnutrition generally is undoubtedly due to its higher content of vitamin A. Quantitative work is now possible in this direction, but the details of the method are not given. By such means it was determined that crude cod-liver oil is 250 times more potent than butter. The use of highly refined cod-liver

oil (subjected to drastic agencies which destroy the vitamin) is therefore to be condemned —W. D. H.

389. Xerophthalmia and Dystrophy in Young Children. C. E. Bloch (*J. Hygiene*, 1921, **19**, 283-304).—A description of the disease is given, and the clinical evidence for the belief that the disease is caused by deprivation of the fat-soluble vitamin is set forth. Xerophthalmia is apparently commoner in Denmark than in any other country in Western Europe, due probably to the fact that poor people, especially in country districts, do not eat butter; margarine is substituted for it. Owing to the German submarine blockade in 1917 the Danish Government was compelled to ration butter and sell it at such a low price that the poorest people could buy it; xerophthalmia disappeared.—W. E. G.

390. A Note on the Differentiation of the Yellow Plant Pigments from the Fat-Soluble Vitamins. M. Stephenson (*Biochem. J.*, 1920, **14**, 715-20).—The author confirms the observations that carotene is not identical with the vitamin A. The colouring matter of butter fat may be removed by filtration through charcoal without the vitamin content of the fat being appreciably lowered.—J. C. D.

391. Note on the Vitamin Content of Milk. F. G. Hopkins (*Biochem. J.*, 1920, **14**, 721-4).—The original results published by the author in 1912 are confirmed, and the cause of the discrepant results reported by other investigators has not been traced. Seasonal variations in the food value of the milk may be one cause, although an experiment on the vitamin value of milk secreted by goats on summer and winter diets yielded little evidence on this point. There appears to be a seasonal variation in the growth energy of rats.—J. C. D.

392. The Effects of Heat and Aeration upon the Fat-Soluble Vitamin. F. G. Hopkins (*Biochem. J.*, 1920, **14**, 725-33).—The vitamin A is readily destroyed at 120° when aerated, but is apparently stable at this temperature in the absence of oxygen. Presumably the vitamin is destroyed by oxidation.—J. C. D.

393. Effect of Heat and Oxygen on the Nutritive Value of Butter. J. C. Drummond and K. H. Coward (*Biochem. J.*, 1920, **14**, 734-9).—Destruction of vitamin A readily occurs at high temperatures in the presence of air, probably as the result of an oxidation process. This loss of nutritive value may be comparatively rapid at temperatures as low as 37°.—J. C. D.

394. The Action of Ozone on the Fat-Soluble Factor in Fats. S. S. Zilva (*Biochem. J.*, 1920, **14**, 740-1).—Exposure to ozone rapidly inactivates the vitamin in cod-liver oil. This also supports the view that destruction of the vitamin A may be caused by oxidation.—J. C. D.

395. The Nutritive Value of Lard. J. C. Drummond, J. Golding, S. S. Zilva, and K. H. Coward (*Biochem. J.*, 1920, **14**, 742-53).—The pig is able to store vitamin A in its body-fat when fed upon a diet containing ample supplies of that accessory substance, but when the diet is low in vitamin A storage apparently does not occur. The processes employed for the manufacture of lard may cause considerable loss of vitamin by oxidation (see previous three abstracts).—J. C. D.

396. Rhubarb is an Antiscorbutic. Edith M. Pierson and R. A. Dutcher (*Science*, 1920, **51**, 70).—Experiments on guinea-pigs. Boiling rhubarb juice for 15 minutes does not destroy its power.—W. D. H.

397. The Relation of Fodder to the Antiscorbutic Potency and Salt Content of Milk. A. F. Hess, L. J. Unger, and G. C. Supplee (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18**, 39).—Five cows were given fodder containing practically no antiscorbutic vitamin for a period of 3 weeks. On this diet the milk-flow decreased. A sample of milk at the end of this period was dried. The cows were then put out to pasture for 3 weeks, and a day's sample of milk was collected and dried in the same way. Feeding experiments

with guinea-pigs showed that the " dry fodder " milk was almost devoid of antiscorbutic potency, whereas the " pasture " milk was rich in this factor. The " dry fodder " milk contained less Ca, P, and citric acid, but more S than the " pasture " milk.—D. H. de S.

398. Changes in Organs by Diets Deficient in Antiscorbutic Vitamin. V. K. La Mer and H. L. Campbell (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 32).—The adrenal glands show an increase in weight varying with the length of time during which the animal was on the scorbutic diet. The liver is not affected. The heart and kidneys may increase in size. These results were obtained with guinea-pigs.—D. H. de S.

399. Relation of Fodder to the Antiscorbutic Potency and Salt Content of Milk. A. F. Hess, L. J. Unger, and G. C. Supplee (*J. Biol. Chem.*, 1920, **45,** 229-35).—The diet of the cow is a most important factor in determining the antiscurvy value of the milk produced. The results confirm those of Hart, Steenbock, and Ellis (Abstract No. 1937, Vol. V., p. 307), and of Dutcher and others (Abstract No. 1938, *ibid*). The danger of setting up rigid milk standards which disregard this fact is pointed out.—J. C. D.

400. Vitamin Studies. VI. The Influence of the Diet of the Cow upon the Nutritive and Antiscorbutic Properties of Cow's Milk. R. A. Dutcher, C. H. Eckles, C. D. Dahle, S. W. Mead, and O. G. Schaefer (*J. Biol. Chem.*, 1920, **45,** 119-32).—The milk yielded by 2 cows fed upon a vitamin-poor ration was of markedly lower nutritive value and antiscorbutic potency than that obtained when the animals were fed on a diet adequate in vitamins.—J. C. D.

401. Sur l'action antiscorbutique de la pomme de terre crue, broyée et intacte. M. Bezssonoff (*Compt. rend.*, 1921, **172,** 92-4).—Guinea-pigs were the subjects of experiment. The diet consisted of oats and water, with the addition of raw potato. Intact raw potato was antiscorbutic, but crushed potato had little or no antiscorbutic effect.—J. A. M.

MILK

402. Der Abbau der Eiweisskörper einiger Milcharten in den gebräuchlichsten Genussformen durch Pepsinsalzsäure und Pankreatin, unter Berücksichtigung von Elektrolyt- und Nichtelektrolytzusätzen. A. Gabathuler (*Fermentforschg.*, 1920, **3,** 81-192) —The proteins of boiled milk are less easily digested by pepsin in hydrochloric acid solution, or by pancreatin, than those of raw milk. This is very marked in the case of goat's milk. Bacteria affect the ease with which digestion proceeds, so that milk containing certain organisms may show the opposite behaviour when the digestibility of the raw milk is compared with that which has been heated for a short time only.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

403. Recherches expérimentales sur le colostrum. C. Porcher and L. Panisset (*Compt. rend.*, 1921, **172,** 181-3).—The authors believe that the characteristics of colostrum are due to retention of milk in the gland during the latter part of pregnancy. Lactose is absorbed from the retained milk, and phagocytes pass into it and become filled with droplets of fat. Milk injected into the peritoneal cavity of a guinea-pig undergoes transformation into a fluid closely resembling colostrum, except that the lactose is totally absorbed and is not replaced by freshly secreted material.—J. A. M.

404. Über den Einfluss der Molke auf das Darmepithel—VIII. E. Freudenberg and H. Mammele (*Jahrb. f. Kinderheilk.*, 1920, **92,** 287-93; compare Abstract No. 2847, Vol. V., p. 453).—The whey of cow's and human milk differs in its influence on respiratory processes in the cells of the intestinal epithelium. The differences are not due to the influence of colloid inhibitors, nor to variations in citric acid content, but to a greater amount of lipoids in the cow's milk which further oxidation; there must be still another

(at present unknown) factor, for the difference between the 2 wheys is evident even after the lipoids are removed.—W. D. H.

405. Ernährungsstudien bei Neugeborenen—III. B. Schick (*Zeitsch. f. Kinderheilk.*, 1920, **27,** 57-78).—The author recommends nutrition with sugared milk of women (100 gm. milk + 17 gm. sugar) in cases of premature birth. The caloric value is thus doubled; half of the quantity of milk must therefore be given. In consequence of the smaller protein and salt content this food can be given only during 5 to 8 weeks with good results.—H. W.

URINARY SYSTEM

406. Quelques considérations concernant l'action des variations de la température sur le tonus vésical et, plus généralement, sur le tonus de la matière vivante. Jacques Roskam (*Arch. intern. physiol.*, 1920, **15,** 473-5).—*In situ*, chez le chien à système nerveux intact, la vessie se contracte sous l'influence de toute variation thermique—positive ou négative, brusque ou lente—à partir de la normale (environ 38° C.). Extraite de l'organisme, la vessie, pendant la première phase de sa survie, se contracte sous l'influence de toute variation thermique à partir de la normale; après un laps de temps variable, elle entre dans la seconde phase de sa survie et se dilate par le refroidissement, se contracte par l'échauffement. Ou cours de la phase I, les réactions de la vessie aux variations thermiques sont mixtes, neuro-musculaires; les phénomènes contractiles que l'on observe au cours de la phase II, sont purement musculaires. Cette propriété de posséder un tonus d'autant plus élevé que la température se rapproche davantage d'une température optimale, ne serait pas l'apanage du seul tissu musculaire lisse; elle serait vraisemblablement une propriété essentielle de la matière vivante, en l'absence de l'intervention du système nerveux.—L. F.

407. The Ratio between the Urea Content of Urine and Blood. T. Addis and D. R. Drury (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 38).—After the administration of urea and large amounts of water the ratio between the urine and blood urea is at first very variable, but after the maximum urea concentration in the blood has been obtained, and the concentration is slowly falling, the ratio becomes constant for each individual within fairly narrow limits. Food, excitement, and other factors produce variations even under these conditions. The authors have not been able to confirm the conclusion of Austin, Stillman, and Van Slyke, that the ratio of urea excretion varies with the square root of the volume of urine when the blood urea concentration is constant.—D. H. de S.

408. Über den Harnstoff-N (Bromlauge-N) Gehalt der Gewebe und über quantitative Beziehungen zwischen Harnstoff und Rest-N in den Gewehen und im Blut unter normalen und pathologischen Verhältnissen. E. Becher (*Deutsch. Arch. f. klin. Med.*, 1920, **134,** 331-41).—The " hypobromite N " of the blood is the same normally in the blood and tissue (except in fatty tissue, where there is very little). The investigation was made in human cadavers. In renal insufficiency the residual nitrogen increased in the tissues, whereas in the blood the hypobromite N rises due to urea retention.—H. W.

409. Die Bedeutung des Quellungsdrucks der Serum-Eiweisskörper für den Flussigkeitsaustausch zwischen Blut und Gewebe und für die Harnabsonderung. A. Ellinger (*Münch. med. Woch.*, 1920, **67,** 1399-1401).—The author measured the œdema produced by perfusing frogs' legs with Ringer's solution. He noted that the use as perfusion fluid of either horse serum or a strong glucose Ringer mixture did not cause œdema. The addition of caffeine lessened the power of serum to prevent œdema, but not that of the glucose-Ringer mixture. The addition of caffeine to serum quickened the rate at which serum filtered through a Bechhold ultra-filter. Consequently caffeine lessens

the " Quellungsdruck " of serum proteins. Hence its action as a diuretic. Pyridine-betaine was found to lessen the power of serum to prevent œdema when perfused through a frog, and also to increase the rate of serum filtration through an ultra-filter. Pyridine-betaine, when tried, was found to be a good diuretic.—J. H. B.

410. The Urea Concentration Test for Kidney Function. E. Weiss (*J. Amer. Med. Assoc.*, 1921, **76,** 298-300).—The report on this test is favourable, but the author thinks that other tests (*e.g.*, the phenolsulphonephthalein test) should be done as well. The urea in the urine should, if possible, be estimated by the urease method.—C. L. E.

411. Über die Auslösung intermediärer Kochsalzverschiebungen von Zentralnervensystem aus—I. W. H. Veil (*Arch. exp. Path. Pharm.*, 1920, **87,** 189-200).—If experimental polyuria is produced by piqûre into the 4th ventricle, the concentration of NaCl in the blood diminishes shortly afterwards, and an absolute hypochloræmia and a transient hydræmia occur, followed by an inspissation of the blood. The kidney itself does not participate in this phenomenon.—H. W.

412. Stalagmometrische Untersuchungen an Urinen und ihre Anwendung auf die klinische Pathologie. W. Schemensky (*Münch. med. Woch* , 1920, **67,** 773).—Small quantities of substances occur in normal urine which raise the surface tension, and the changes in the surface tension they produce can be measured by the stalagmometer. These substances, which are colloids, occur in larger amounts in urine containing bile pigments, and in the urine of patients suffering from nephritis and pyelitis. Albumins and albumoses only form a part of these colloidal substances.—J. H. B.

413. The Presence of Hæmolytic Substances in Human Urine. E. Ponder (*Brit. J. Exper. Pathol.*, 1921, **2,** 34-40).—Hæmolytic activity was observed as a regular occurrence in the urines of insane persons. Such activity was also found to occur in the urines of healthy persons. It was found that in previous work on this subject certain important factors were overlooked. The hæmolytic substance appeared to be a stable chemical compound, capable of being extracted from the urine with various solvents. Its activity was inhibited by various substances, notably blood-serum. There seems to be sufficient evidence to justify the suggestion that the hæmolytic power of urine depends on its containing minute traces of bile acids or their salts, and that the occurrence of hæmolytic activity in urine is physiological.—W. D. H.

414. Über die Verteilung des Indicans im Organismus unter normalen und pathologischen Verhältnissen. E. Becher (*Deutsch. Arch. f. klin. Med.*, 1920, **134B,** 325-30).—The indican is relatively increased as compared with residual nitrogen and urea in the serum in cases with renal insufficiency. The same increase is also found in nephrectomised dogs. The indican in the tissues and in red corpuscles is much lower. The brain has among all tissues the lowest indican content.—H. W.

415. Zur Kenntnis der adialysabeln Bestandteile des Menschenharnes. H. Pribram and G. Herrnheiser (*Biochem. Zeit.*, 1920, **111,** 30-8).—The authors have studied the non-dialysable fraction of urine from man, and find that there are, as others have stated, certain physiological effects associated with this fraction for example, when injected into rabbits, there is contraction of the pupils and diminished reflex activity, and drowsiness. When this non-dialysable fraction of urine is treated with acetic acid, the precipitate has lost, and the filtrate has gained, the physiological properties above mentioned, so that it would appear that the active substances are not themselves colloidal, but only associated with the undialysable substances. Unfortunately the authors could get no further.—E. C. G.

416. Relationship between the Plasma Bicarbonate and Urinary Acidity following the Administration of Sodium Bicarbonate. W. W. Palmer, H. Salvesen, and H. Jackson, Jr. (*J. Biol. Chem.*, 1920, **45,** 101-11).—The H-ion concentration of urine is a safe guide

in the therapeutic use of sodium bicarbonate if the first evidence of any change in the urinary acidity is noted.—H. E. R.

417. The Influence of the Colour of the Urine on Readings of the Phenolsulphonephthalein Test. V. O. Pedersen (*N.Y. Med. J.*, 1920, **112,** 477-83).—An extensive tabular presentation of data obtained in an attempt to account for the apparent loss of 15% of the dye as indicated on the scale between the 85% of the material excreted by the patient in 2 hours and the 100% of the phenolsulphonephthalein that has been injected, from which it is concluded that the colour of the urine interferes markedly with the accurate determination of the excreted dye. Allowances for this error are prescribed according to the depth of the original tint of the urine.—W. D. H. (*Chem. Abstr.*).

418. Étude sur l'élimination urinaire chez les herbivores. J. Chaussin (*J. de physiol. et de pathol. gén.*, 1920, **18,** 1132-53).—In these animals, chlorides and urea make up a smaller proportion of the total molar concentration than in man, chlorides especially being deficient. Alkaline carbonates, particularly that of potassium, are present in notable quantity. There is a mutual compensation between the concentrations of the carbonates and urea, as between that of chlorides and urea in man. There is also a rhythm in this compensation, which requires further investigation. The introduction of sodium chloride into the diet has also an effect on the amount of alkali in the urine. —W. M. B.

METABOLISM

419. La dépense physiologique mesurée chez le soldat en marche de route. A. D. Waller, assisted by Mlle. G. de Decker (*Bull. de l'acad. roy. de Belgique*, December, 1920, No. 11, reprint, 8 pp.).—This was a lecture given by Prof. Waller during a recent visit to Belgium, when facilities were placed at his disposal by the military authorities there. It gives in outline his method, which is already known to readers of these abstracts from previous communications made by the author. The new aspect of the work is that the expired air was collected without interfering with the march. The collection was made during measured lengths (50 metres) at each kilometre of the march on the flat in 2 soldiers. The march was one of 16 kilometres, 8 out and 8 home. The caloric equivalent of 1 c.c. CO_2 varies with the respiratory quotient, but that was not ascertained; the figure taken is that 1 c.c. $CO_2 = 5$ cal., and this is utilised in calculating the calories per kilo per hour. As the march continued it was found, as in previous researches, that it became progressively more expensive to the soldier; thus, in the first soldier the c.c. of CO_2 per second increased from 4·7 during the first kilometre to 20 during the 8th, then, after a rest, the home journey gave 3 c.c. during the 9th kilo to 22 during the 16th. The figures for the second soldier are very similar. The important figure determined is that approximately $\frac{1}{10}$ of a c.c. of CO_2 per kilo per horizontal metre is produced, or 250 cal. per hour.—W. D. H.

420. Récherches sur la dépense d'énergie dans la marche de l'homme en terrain horizontal ou incliné. H. Magne (*J. de physiol. et de pathol. gén.*, 1920, **18,** 1154-73).—In walking on the level the consumption of oxygen rises with the length and frequency of step. The amount per step has a minimum at 100 half-steps per minute for the usual length of step. To obtain economy in obtaining a given rate of progress, a particular combination of length of step and rate is needed. The most economical velocity is 63 metres per minute. In walking up or down hill the additional expenditure is not merely summed algebraically with the work of gravity. There is an economy due to the new condition of equilibrium. In descending, this economy may be greater than the work done by gravity.—W. M. B.

421. Basal Metabolism Determinations: Tests with Two Portable Closed Circuit Respiration Apparatus. H. N. Tihen (*J. Amer. Med. Assoc.*, 1921, **76,** 86-8).—Of the Benedict and Jones apparatus, the latter is especially convenient for clinical use.—C. L. E.

422. The Fundamental Classification of Disease by the Basal Metabolic Rate. W. M. Boothby (*J. Amer. Med. Assoc.*, 1921, **76,** 84-6).—Diseases are placed in 3 groups according to whether the basal metabolism is unchanged, increased, or diminished. Care must, however, be taken that the metabolism determined is really the basal rate. The determinations are particularly valuable in disturbances of thyroid function.—C. L. E.

423. Metabolism of Adolescents. F. C. Wright (*J. Roy. Naval Service*, 1920, 6, 277-87; 1921, **7,** 21-36).—These papers are mainly statistical, and relate to the intake and output of energy in boys in training-ships, and give valuable data which will interest those concerned in metabolism. They averaged 16 years of age, and the daily output approached 3,700 calories per diem. The minimum daily intake recommended is 3,800 for boys æt. 13 to 14, and 4,100 for those æt. 15 to 16.—W. D. H.

424. Die Gelidusimethode zur Feststellung des Ernährungszustandes. F. Hamburger and K. Jellenigg (*Wiener. klin. Woch.*, 1920, **33,** Nr. 52, 1131-2).—The expression "Gelidusi" (Pirquet) means a certain relation between the weight of the body and the length of the body in sitting. This is a constant. The method is, according to the experiences of the authors, often of no use for the determination of the state of nutrition.—H. W.

425. Sur la croissance des poissons maintenus en milieu de température constante. P. Audige (*Compt. rend.*, 1921, **172,** 287-9).—Fish may be classified as eurythermic or stenothermic according as they grow more rapidly at a relatively high (24° to 25° C.) or a relatively low (15° to 16° C.) constant temperature. The latter group includes *Salmo cridens*.—J. A. M.

426. Correlations of Size and Growth. J. A. Harris (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 4-5).—The correlations between growth increments of the organism during the different growth periods, and between the size of the organism at any stage and any or all subsequent growth increments, can be determined by means of the formulæ given.—D. H. de S.

427. Inanition and the Testis in the Albino Rat. D. M. Siperstein (*Anat. Rec.*, 1921, **20,** No. 4).—In rats 2 days old the testis increases in weight in spite of 50 hours of starvation, but mitoses are reduced in number. During underfeeding, spermatogenesis is arrested at the primary spermatocyte stage. Spermatocytes degenerate and are reabsorbed. Spermatogonia and Sertoli cells show degeneration changes only in very extreme cases. Acute inanition in adult rats, with 30 to 47% loss in body-weight, produces degenerative changes in a few irregularly scattered tubules. All the other tubules show an apparently normal structure. Mitosis is very persistent in the seminiferous epithelium, even occurring in tubules where nearly all the cells are more or less degenerated. Refeeding after inanition results in a rapid return to the normal structure. Definite hypertrophy of the interstitial tissue and hyperplasia of the interstitial cells were noted only during the regenerative period.—W. D. H. (*W. I.*).

428. Metabolism of Infantile Atrophy. G. B. Fleming (*Quart. J. Med.*, 1921, **14,** 171-86).—The respiratory quotients of these children do not suggest inability to use fats or carbohydrates. The heat output of normal infants in the resting, absorptive state is 50 to 60 cal. per day. Children whose weight is less than 65% of the normal have a smaller output. It is suggested that in early stages of atrophy the loss falls mainly on metabolically inactive tissues, wastage of the active tissues occurring later. Gastro-intestinal disturbances with defective absorption, especially of carbohydrates, is a potent cause of failure to thrive.—W. D. H.

429. Über die Atrophie der menschlichen Organe bei der Inanition. M. Kreger (*Zeitsch. f. angewandte Anatom. u. Konstitutionslehre*, 1920, **7,** 87-134).—The spleen liver, pancreas, heart, testis, thyroid, and kidneys show great diminution of their weight with the general atrophy caused by inanition (detailed tables are given). The brain and the adrenal lose little or no weight. The loss of weight of liver and kidneys is less in cases with infectious diseases.—H. W.

430. A Method for obtaining Uncontaminated Specimens of Urine from the Billy-Goat, with some Notes on the Normal Metabolism of this Animal. R. A. Peters (*Biochem. J.*, 1920, **14,** 697-708).—The fæces were collected in a bag, thus preventing contamination of the urine. Variations of diet affect the acidity of the urine. The urine becomes acid during starvation. Administration of acid leads to an increase in the ammonia of the urine. Alkali is readily excreted.—H. E. R.

431. Studien über den intermediären Kohlehydratstoffwechsel beim Menschen. I. Über das Vorkommen von aldehydartigen Substanzen im Harne bei Diabetes Mellitus. W. Stepp and H. Lange (*Deutsch. Arch. f. klin. Med.*, 1920, **134,** 47-58).—Volatile substances are found in the urine of some cases of diabetes, which appear from their reactions to be acetaldehyde. This aldehyde is always observed, together with acetone and aceto-acetic acid, and appears in most cases at the beginning of the acidosis.—H.W.

432. Über den intermediären Kohlehydratstoffwechsel beim Menschen. II. Über das quantitative Verhalten der Ameisensäure im normalen und pathologischen Blute. W. Stepp and H. Zumbusch (*Deutsch. Arch. f. klin. Med.*, 1920, **134,** 112-8).—The quantity of formic acid found in the blood of healthy men fluctuates between 1·12 and 8·4 in 100 c.c. blood. Average value, 2 to 5 mg. Diabetic and nephritic patients have no formic acid, or its value is smaller than in normal cases.—H. W.

433. Zur Frage der Fettbilung aus Kohlehydraten beim Menschen. G. Baumgardt and M. Steuber (*Deutsch. Arch. f. klin. Med.*, 1920, **134,** 241).—Formation of fats from carbohydrates is proved in respiration experiments.—H. W.

434. Additional Experiments showing the Production of Fat from Protein. G. Lusk (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 171-2).—This confirms previous work carried out under similar experimental conditions by Atkinson and Lusk (see Abstract No. 3051, Vol. IV., p. 494).—D. H. de S.

435. Effect of a Protein Meal given to a Man at the End of an 8-Day Fast. W. S. McCann (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 173-5).—During the first 2 hours after the meal the respiratory quotient was low, like that found in severe diabetes or in phloridzin glycosuria. It is thought probable that the quotients in this case were obtained by the same mechanism as in diabetes, except that the glucose, instead of being excreted in the urine, was stored as glycogen.—D. H. de S.

436. Über den Einfluss des Lichtes auf den intermediären Eiweisstoffwechsel. P. Liebesny (*Zeit. f. physik. u. diätet. Therap.*, 1920, **24,** 182-92).—In 2 dogs fed on a constant diet of horse tripe it was found that exposure to the ultra-violet rays from a mercury vapour lamp caused an appreciable reduction in the volume of urine and in its total nitrogen, creatinine, and neutral sulphur content.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

437. Fermentation of Cellulose in the Paunch of the Ox. A. Krogh and H. O. Schmit-Jensen (*Biochem. J.*, 1920, **14,** 686-96).—The contents from the paunch were allowed to ferment, and the gases produced were analysed. No gain or loss of nitrogen occurred. The ratio $\frac{CO_2}{CH_4}$ is 2·6 on an average, and this figure can be used to correct the results of metabolism experiments if the amount of methane produced has been measured.—H. E. R.

438. Calcium Metabolism and the Teeth. C. F. Rumsey (*Brit. Dental J.*, 1921, **42,** 49-54).—The incidence of caries is complex, and diet is a most important factor; the

following subjects are dealt with: (1) Milk is the ideal calcium-containing food, and should be relied on during the growth period; (2) bread should be made so as to contain more cellulose and more vitamin; (3) among fats, olein is preferable to the more solid fats; (4) Ca intake should also be regulated in adults, and symptoms of thyroid abnormality should be recognised and treated.—W. D. H.

439. Beiträge zur Stoffwechselneurologie. I. Zur Stoffwechselneurologie der Medulla Oblongata. T. Brugsch, K. Dresel, and F. H. Lewy (*Zeitsch. f. d. exp. Path. u. Ther.*, 1920, **21B**, 358-408).—In rabbits, wounds were made with a fine needle in certain areas of the medulla oblongata. Then the metabolism of the animals was investigated before and afterwards with regard to the quantity, specific gravity, Cl, sugar, N, and allantoin contents of the urine, and the Cl and sugar of the blood. The place of the wound was then exactly determined by histological investigation. Hyperglycæmia and glycosuria occur if the sympathetic vagus nucleus is wounded (unilateral injury is sufficient). The centre for the salt and water metabolism is a group of ganglion cells in the formatio reticularis on the medial side of the corpus restiforme and in the immediate neighbourhood of the centre for the parotid secretion. An isolated centre for the metabolism of urea and purines could not be detected.—H. W.

440. Pyrimidine Metabolism. D. W. Wilson (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 179-80).—Pyrimidines were prepared from yeast nucleic acid and administered to rabbits. Uracil nucleoside caused an increased excretion of urea and of the undetermined nitrogen; a part of the increase of the latter was due to the excretion of free uracil. A mixture of cytosine and uracil nucleosides caused an increased excretion of urea, and usually no increase in the undetermined nitrogen; uracil was isolated from the urine of one animal and barely detected by a colour reaction in another. There was no increase of creatine, creatinine, or purines. From these and other data the author concludes that, in the metabolism of nucleic acid, before the pyrimidine is liberated, and even before the nucleoside is formed, the pyrimidine is altered in such a way that it may be further broken down and its nitrogen converted into urea.—D. H. de S.

441. Über das Verhalten einiger schwefelhaltiger Pyrimidinderivate im Tierkörper. R. Freise (*Zeit. physiol. Chem.*, 1920, **112**, 45-52).—Thiouramil and the ammonium salt of γ-thiopseudouric acid were administered to dogs, and the sulphur and nitrogen excretion in the urine was followed. The results throw but little light on the intermediary metabolism of pyrimidine or purine derivatives.—H. W. D.

442. Neue Versuche über Ausschiedung einiger Aminosäuren durch den Harn. W. Blum (*Beitr. z. Physiol.*, 1920, **1**, 385-438).—Experiments on the utilisation of amino-acids taken by the mouth. The amount of the amino-acid escaping in the urine was estimated by formol titration. In man, of a dose of 10 gms. of glycine, 8·1% of the amino-acid was lost in the urine; the loss was somewhat reduced (to 5·6%) if the glycine was taken in 10 hourly doses of 1 gm. each. A young pig wasted 27% of 14 gms. of glycine, an older animal lost only 7% of double the quantity. The horse was found to utilise glycine only to a very limited extent; *d*-alanine was completely utilised in the human body, but of an equal quantity of the racemic amino-acid 12 to 17% was eliminated.—T. R. P. (*Ber. u. d. ges. Physiol.*).

443. Weitere Untersuchungen über Entstehung und Ausscheidung von Oxalsäure im menschlichen und tierischen Organismus. L. Wegrzynomski (*Kriega pamiatkowa wyd. w.* **25** *roczn. Wydz. Lek. Lwow.*, 1920, 157).—Endogenous oxalic excretion in fasting rabbits was 0·15 to 0·19 mg. per kg. per day. More oxalic acid was excreted on a diet of oats than on carrots, and glucose (30 gms. per day) gave the large amount of 2 mg. per kg. per day. Glucose was toxic to oat-fed animals, unless $CaCO_3$ was also administered. In normal and leukæmic men administration of 4 to 5 gms. of benzene per day

caused a rise in the oxalic acid excretion. There was also an increase when the flow of bile into the intestine was obstructed.—C. L. E. (*Ber. ü. d. ges. Physiol.*).

444. La signification physiologique et le dosage de l'acide formique. A. Slosse (*Bull. soc. chim. biol.*, 1920, **2,** 150-6).—Formic acid appears to represent a definite stage of tissue oxidation, and may be formed by the catabolism of many types of substance. —J. C. D.

ANIMAL HEAT

445. Tiefenthermometrie—IV. B. Zondek (*Münch. med. Woch.*, 1920, **67,** 810-3).—A determination of internal body temperatures after the application of ice-bags to the outside. The paper records temperatures taken in the thigh muscles, peritoneum, intestinal musculature, and in the muscles of the abdominal wall. A fall from 37·7° to 33·2° is found to take place in the peritoneal temperature 1½ hours after application of an ice-bag to the hypogastrium. The fall which will take place in any given patient depends on the thickness of the layer of fat.—J. H. B.

446. Tiefenthermometrie—V. B. Zondek (*Münch. med. Woch.*, 1920, **67,** 1041-2).—Ethyl chloride spray produces a rapid fall of temperature in the subcutaneous tissues of the axilla. It is a useful means of producing a reactive hyperæmia in local inflammatory lesions.—J. H. B.

447. Ein Beitrag zur Kenntnis das Gaswechsels bei Knaben. G. Baumgardt and M. Steuber (*Biochem. Zeit.*, 1920, **111,** 83-90).—By taking special precautions to prevent the children from moving about, a lower heat production was observed than has been observed by previous workers.—E. C. G.

448. Das Verhalten der Körpertemperatur bei mechano-therapeutischen Behandlung und gymnastischen Freiübungen. D. Rancken (*Skand. Arch. f. Physiol.*, 1920, **40,** 92-106).—An investigation of the rise of body temperature produced in a series of subjects by free gymnastic exercises, and by the more restricted exercises used for therapeutic purposes. The changes of temperature were recorded electrically by a resistance thermometer in the rectum. The freer gymnastic exercises caused a rise of several tenths of a degree C. With the less vigorous therapeutic exercises a rise of 0·07° C. was the highest recorded. In both cases the effect was rapidly evanescent.—H. H. D.

449. Clinical Calorimetry. XXIX. Tuberculosis. W. S. McCann and D. P. Barr (*Arch. int. Med.*, 1920, **26,** 663-705).—The basal metabolism in tubercle may be normal or rather higher, but subsides when weight is lost, and rises slightly during febrile conditions. Toxic destruction of protein occurs, but is not a large item. The specific dynamic rise in metabolism produced by a protein meal is of the usual magnitude. The food requirements of these patients are small, either as regards energy or nitrogen. Forced feeding is regarded as unnecessary, and probably harmful in active stages of the disease. Protein increases the respiratory exchange, so protein food should be limited during active stages to put *inter alia* the lungs at rest.—W. D. H.

450. Carbon Dioxide : Heat Ratio in Cattle. H. P. Armsby, J. A. Fries, and W. W. Braman (*Proc. Nat. Acad. Sci.*, 1920, **6,** 263-5).—The ratio of the kg.-cal. of heat produced to the g. of CO_2 eliminated by cattle ranged from 2·1500 to 3·1500. The ratio ranged from 1·8600 to 2·9400 for the standing position, and from 1·6900 to 2·5700 for the lying position. The ratio tended to decrease as the amount of ingested feed increased. The influence of the size of the animal was eliminated by calculation of the results per kg. of live weight. Three equations were obtained in which X represents the g. of air-dried feed ingested per kg. of live weight. (1) The cal. of measured heat per kg. of live weight equals 0·869X plus 14·176. (2) The g. of CO_2 per kg. of live weight equals

0·455X plus 4·365. (3) The ratio of the heat (cal. per kg. of live weight) to the CO_2 (g. per kg. of live weight) equals 2·802 minus 0·0226X. The experimental animals ate from 5 to 27 g. of air-dried feed per kg. of live weight. If animals are consuming dry feed within these limits, and are not performing work, the ratio of heat to CO_2 may be calculated by equation (3), and the production of CO_2 by equation (2); the heat produced may then be calculated from these 2 results.—W. D. H. (*Chem. Abstr.*).

451. Wärmeregulation und Eiweissumsatz. H. Freund (*Arch. exp. Path. Pharm.*, 1920, **88,** 216-26).—If the temperature curve indicates that the heat-regulation mechanism is out of gear, this is always accompanied by increased excretion of nitrogen, which indicates an increase of protein catabolism.—W. D. H.

452. Über den Angriffspunkt der Blutdrüsenhormone bei derWärmeregulation. L. Adler (*Arch. exp. Path. Pharm.*, 1920, **87,** 406-23).—The experiments were made on hedgehogs in their winter sleep. In some animals the central regulation of temperature was upset by an operation, in others the sympathetic was paralysed by ergotoxine, in others both methods were employed. All these animals showed after injections of thyroid extract, of thymus extract, of adrenaline, and of certain proteinogenous amines, a great elevation of body temperature (+7° to +28°). The respiration was accelerated. Extracts of pancreas, epiphysis, and mamma had no effect. But this elevation of temperature is not so great as in intact animals (+7° to +35°). The hormones of these endocrine glands and the proteinogenous amines stimulate oxidation in the peripheral organs, perhaps directly in the cells themselves. They do not regulate the tonus of the heat centres or of the peripheral sympathetic nerves, although such a tonus is necessary for normal peripheral oxidations.—H. W.

ENDOCRINE SYSTEM

453. Biochemistry of Iodine. III. The Comparative Effects of Thyroid and Iodide Feeding on Growth in White Rats and Rabbits. A. T. Cameron and J. Carmichael (*J. Biol. Chem.*, 1920, **45,** 69-100).—The prolonged administration of small doses of desiccated thyroid gland produced in rats a definite decrease in growth rate, a hypertrophy of all the organs concerned with increased metabolism, heart, liver, adrenals and kidneys, and a disappearance of fat. Many of these observations confirm those recorded by Hoskins (*J. Exper. Zool.*, 1916, **21,** 295) and by Herring (*Quart. J. Exp. Physiol.*, 1915-16, **9,** 391; also Abstract No. 1114, Vol. IV., p. 181). The effects appear to be due to the specific action of the iodine-containing thyroid tissue. The results were confirmed by experiments on rabbits.—J. C. D.

454. A Study of the Distribution of Iodine between Cells and Colloid in the Thyroid Gland. II. Results of Study of Dog and Human Thyroid Glands. H. B. v. Dyke (*J. Biol. Chem.*, 1921, **45,** 325-32).—Feeding dogs on iodine causes an increase in the amount of iodine in the whole thyroid, but does not alter the ratio of the iodine in the whole gland to that in the cells of the gland. In human glands the "ratio" is much less variable than the total iodine content. The "ratio" is lower for the dog than for the cow or sheep.—H. E. R.

455. Serumconcentration und Viskosität des Blutes beim Myxödem und ihre Beeinflussung durch Thyreoidin. G. Deusch (*Deutsch. Arch. f. klin. Med.*, 1920, **134,** 342-51).—In myxœdema the viscosity and refractometric power of the serum are considerably increased. The protein content in the blood is therefore higher. After treatment with thyreoidin the protein concentration of the serum is diminished, together with a diminution of the body-weight. The NaCl content of the blood is not under the influence of the thyroid. The method may be useful in the diagnosis of hypothyroidism.—H. W.

456. Experimentelle Untersuchungen über die Wirkung von Wirbeltierhormonen auf Wirbellose. I. Der Einfluss von Schilddrüsenfütterung auf Entwicklung und Wachstum der Schmeissfliege (Calliphora vomitoria). B. Romeis and L. v. Dobkiewicz (*Arch. f. Entwicklungsmechanik*, 1920, **47,** 119-30).—The embryos of *C. vomitoria* develop themselves on thyroid gland more slowly during the first days than do control animals on flesh. The same is the case with the larvæ. But in the second part of the larval period the thyroid animals make up for lost time in their growth. Pupation begins about 35 hours later than with the control animals. The flies also creep out about 35 hours later than the control animals. They show no other difference.—H. W.

457. The Relation of the Thyroid and Adrenals to the Electric Conductivity of Tissues. G. W. Crile (*Endocrin.*, 1920, **4,** 523-6).—The electric conductivity of the brain, liver, spinal fluid, heart, and lungs, is increased in iodism produced by the injection of iodoform into the peritoneal cavity, and there is some indication that an increased conductivity of the brain and the liver is an early effect of thyroid feeding. These observations are correlated with the view that it is the function of the thyroid to metabolise, store, and deliver iodine. A single dose of adrenaline immediately increases the conductivity of the brain, while an excessive amount diminishes it. This action of adrenaline is probably due to its influence upon oxidation. Through the mediation of the nervous system a reciprocal interaction is established among the thyroid, the adrenals, and the nervous system. Iodine alone, adrenaline alone, thyroid extract alone, emotion, exertion, or infection alone, each causes a "kinetic drive," with phenomena similar to those of exophthalmic goitre. The author suggests that this disease may therefore be treated by brain rest, by resection of the thyroid, or by partial removal of the adrenals. —S. V.

458. Influence of the Thyroid on the Suprarenals. P. T. Herring (*Endocrin.*, 1920, **4,** 577-95).—There is evidence that hyperthyroidism increases the size and weight of the adrenals and the adrenaline load of the chromaphil tissues. Hypothyroidism has no effect on the adrenaline load. The theory that one endocrine gland exercises a specific influence upon another only touches a part of the question. The changes in metabolism which occur when any gland is disturbed in function must have a widespread effect. Many of the metabolic changes undoubtedly occur in the liver, and it is unreasonable to suppose that this organ takes no active part in the problems presented by the ductless glands.—S. V.

459. Über Tetanie. II. Über die Tetanie der Katzen. E. Farner and R. Klinger (*Mitteil. a. d. Grenzgebieten d. Med. u. Chirurg.*, 1920, **32,** 469-97).—Accessory parathyroids are found quite regularly in cats in the thymus itself or in the enclosing connective tissue in varying number and size. The progress of tetany after the extirpation of the 4 chief glands is very unequal. The accessory gland is not of great importance for the progress of the tetanic phenomena. Ca salts (per os) have an advantageous effect in contrast to feeding with thyroid substance. Implantation of parathyroid glands only causes a short amelioration. The tetany is a poisoning with bases of the guanidine group. The strength of the tetanic phenomena depends, first on the quantity of the tissue of the glands, and secondly on the quantity of these bases, which are in circulation. The different combinations of the two factors explain the different progress of the tetany.—H. W.

460. Die Bedeutung der Thymus für die Entwicklung der männlichen Keimdrüsen. E. Leupold (*Beitr. z. path. Anat. u. z. allgem. Path.*, 1920, **67,** 472-91).—The author favours, as a result of his own investigations, the following view: The thymus has in the extra-uterine life an influence on the normal evolution of the testes during childhood. It then furthers at puberty time their maturity. But even during evolution of the thymus atrophy of the testis does sometimes occur in childhood. Then the evolution

of the testicle depends on the suprarenal gland. Hypoplasia of the adrenal system is connected with hypoplastic testes. But the influence of the thymus is the more important. In thymus hyperplasia and thymus persistence the evolution of the testicles is especially marked.—H. W.

461. Recherches sur la composition chimique du thymus et sur les rapports pondéraux entre cet organe et le corps thyroïde. E. Zunz (*Arch. intern. physiol.*, 1920, **15,** 459-72).—Il est exceptionnel d'observer une atrophie thymique considérable chez l'homme adulte sain (soldats tués à la guerre). Poids moyen du thymus chez l'homme de 19 à 34 ans: 15 à 16 gr. Le maximum peut dépasser 30 gr. Malgré de grandes variations individuelles, le pourcentage de matières extraites par l'éther tend à s'accroître avec l'âge. Le poids du thymus tant frais, qu'épuisé par l'éther ou desséché tend à être d'autant plus élevé que le poids du corps thyroïde est moindre. Il est toujours inférieur à celui du corps thyroïde quand ce dernier pèse plus de 29 gr. à l'état frais. Il lui est supérieur chaque fois que le corps thyroïde pèse moins de 19 gr. Les teneurs du tissu thymique proprement dit en résidu sec, en azote, en phosphore et en cendres ne paraissent pas présenter de relations soit avec l'âge du sujet, soit avec le poids du thymus frais ou proprement dit, soit avec le poids du corps thyroïde. La composition chimique du tissu thymique proprement dit est relativement constante chez l'adulte bien portant. La teneur en phosphore lipoïdique du thymus est relativement constante et n'est pas très considérable.—L. F.

462. Über die Veränderungen der endokriner Organe, besonders der Nebennierenrinde nach der Unterbindung des Ductus pancreaticus und ihre Bedeutung. Y. Tokumitsu (*Verhandl. d. japan. path. Gesellsch.*, Tokyo, 1916, **6,** 21-3).—On tying the pancreatic duct in rabbits there is atrophy of all pancreatic elements. Later on the islets grow to, or above the normal mass. In the adrenals the cortex hypertrophies, the medullary cells become smaller and more crowded, and give a clearer chromaphil reaction. The thyroid enlarges. In the pituitary the eosinophil cells decrease and the "Hauptzellen" increase. For a short time after the operation glycosuria can be produced with a smaller quantity of adrenaline than with normal animals. Destruction of the adrenal cortex causes no glycosuria, but after tying the pancreatic duct such destruction causes definite glycosuria. Normal rabbits die from the loss of three-quarters of the adrenal cortex, but after occlusion of the pancreatic duct the loss of one-quarter of the cortex is fatal. When thyroidectomy is combined with the above procedures glycosuria is prevented. On these data the author bases a theory of a functional antagonism between the thyroid and the pancreas.—S. V. (*Endocrin.*).

463. Contribucion al estudio fisiopatolojico de la adrenalina. H. Sepúlveda V. (*Inaug. Dissertation*, Santiago, 1917).—To estimate adrenaline in the blood, the author adds the blood-serum drop by drop to 4 or 5 c.c. of a 5% solution of mercuric nitrate in $N/10$ $AgNO_3$ until there is complete precipitation. The precipitate is filtered off, and to the filtrate is added drop by drop standardised permanganate solution until a light rose colouration is produced. Normally the adrenaline reaches a maximum value of 0·30 grm. per mil. The determinations in pathological conditions appear to have considerable prognostic value.—S. V. (*Endocrin.*).

464. Über die mikroskopisch feststellbaren, functionellen Veränderungen der Gefässkapillaren nach Adrenalinwirkung. J. Kukulka (*Zeit. f. d. exp. Path. u. Ther.*, 1920, **21,** 332-40).—A change in the capillaries consisting of a folding of their wall and a prominence of the cells of the wall in the interior of the vessels as seen under the influence of adrenaline. All these changes disappeared when the adrenaline effect vanished.—H. W.

465. Sensibilisierung des Trendelenbergschen Froschpräparate zur Adrenalinmessung. T. Alday-Redonnet (*Biochem. Zeit.*, 1920, **110,** 306-18).—For small quantities

of adrenaline the Trendelenberg frog muscle preparation has advantages over the mammalian blood-pressure method, but is less accurate. Certain inconstancies, however, are overcome by adding more Ca to the perfusion fluid; this sensitises the preparation, which has been harmed by presumably upsetting the proper balance between K and Ca during perfusion.—E. C. G.

466. The Modification of the Action of Adrenaline by Chloroform. W. J. R. Heinekamp (*J. Pharm. Expt. Ther.*, 1920, **16,** 247-58).—Working on dogs, evidence is produced to show that inhibition of the heart by adrenaline, when the animals are anæsthetised by chloroform, is due primarily to paralytic dilatation of the heart, ventricular fibrillation supervening on this condition. The adrenaline action is peripheral, and occurs after section of the vagi. The blood-pressure has no definite reflex relation to the production of paralytic dilatation, but has an important direct action by preventing the emptying of the ventricle.—E. M.

467. L'action cardio-vasculaire de l'adrénaline chez l'homme. Différence de l'effet physiologique à l'état sain et à l'état pathologique. R. Porak (*J. de physiol. et. de pathol. gén.*, 1920, **18,** 1194-1202).—In the normal subject the rise of blood-pressure for a given dose varies according to the individual. This fact must be taken into account in testing the reaction to adrenaline in disease. Thus the indications of disorders of internal secretion may be modified by those due to affections of the vascular or nervous system.—W. M. B.

468. Experimental Production of Gigantism by Feeding on the Anterior Lobe of the Hypophysis. E. Uhlenhuth (*J. Gen. Physiol.*, 1921, **3,** 347-65).—Metamorphosed salamanders (*Amblystoma opacum* and *tigrinum*) grew much more rapidly on anterior lobe of hypophysis than did controls on earthworms. Experimental giants were produced. —W. M. B.

469. Experimental Gigantism produced by Feeding on Pituitary. E. Uhlenhuth (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 11-14).—The feeding of salamanders with anterior lobe of pituitary causes acceleration of growth and continuation of growth beyond the specific size of the species, thus resulting in hypophyseal gigantism; feeding with posterior lobe has neither of these effects, but may retard growth. Larvæ do not respond to the anterior lobe diet; the growth-promoting effect of the gland commences after metamorphosis has taken place.—D. H. de S.

470. The Pituitary Body. J. Camus and G. Roussy (*Endocrin.*, 1920, **4,** 507-22).—The polyuria which occurs on extirpation of the pituitary is not due to the removal of this organ, but to a lesion of the opto-peduncular region at the base of the brain. This region lies at the level of the grey substance of the tuber cinereum in the vicinity of the infundibulum This zone seems to play some part in the mechanism of water retention in the organism. Atrophy of the genital organs and the " adiposo-genital syndrome " are likewise due less to any hypophyseal lesion than with trouble at some point in the base of the brain. The same applies to the changes in tolerance to carbohydrates and the appearance of alimentary glycosuria. These experiments, if the results are confirmed, will necessitate a reconsideration of our whole attitude in relation to the pituitary body.—S. V.

471. Contribucion al estudio de la hipofisis. A. Silva (*Inaug. Dissert.*, Santiago, 1917).—In normal subjects pituitary extracts give rise to vascular hypotension. In the tachycardia of Graves' disease they produce also polyuria, transient glycosuria, pallor of the skin, and contractions of the intestines and uterus.—S. V. (*Endocrin.*).

472. Effect of Thyroid-Feeding and of Thyro-Parathyroidectomy upon the Pituitrin Content of the Posterior Lobe of the Pituitary, the Cerebro-Spinal Fluid, and Blood. P. T. Herring (*Proc. Roy. Soc.*, 1921, **92B,** 102-7).—The pituitrin content of the posterior lobe of the pituitary is not affected by thyroid feeding or by thyro-parathyroidectomy,

Pituitrin could not be detected in the cerebro-spinal fluid of the 4th ventricle in normal, thyroid-fed, and thyro-parathyroidectomised cats. Defibrinated blood of normal thyroid-fed, and thyro-parathyroidectomised cats shows no appreciable differences in its action upon the uterus of the rat. Blood of the thyroid-fed cat has a greater depressor action upon the circulation than has that of the normal animal. The blood of the thyro-parathyroidectomised cat exercises a pressor effect on the circulation, diminution of kidney volume, and secretion of urine, due probably to the presence of guanidine or allied substances.—J. A. H.

473. Sur la variabilité d'action des extraits hypophysaires. J. Parisot and P. Mathieu (*J. de physiol. et de pathol. gén.*, 1920, **18,** 1182-93).—Small and large doses have opposite effects on involuntary muscle in general, including heart and bloodvessels. The small doses cause excitation; the large doses inhibition. The effects of therapeutic doses are the excitatory ones.—W. M. B.

474. Zur Kasuistik der hypophysären Fettsucht. A. Himmelreich (*Med. Klinik*, 1920, Nr. 49, 1264-6).—The symptoms of pituitary adiposity developed in a boy (æt. 11 years) with hereditary hypothyroidism after some infectious malady. X rays showed the pituitary to be enlarged. Thyroidin treatment cured mother, but had no effect on the child.—H. W.

475. Metabolism in Diabetes Insipidus. H. Goeke (*Arch. Verdauungskrankh.*, 1920, **26,** 365-97).—The polyuria is mainly due to the inability of the kidney to excrete NaCl and salts in the normal concentration. There is marked hyperchloræmia and hyperosmosis. The addition of NaCl leads to its increase in the blood, and is an additional stimulus to diuresis. H_2O retention in the body is, however, possible, but it is of a low grade, while the excretion of the additional NaCl is slightly retarded, but is complete by the next day. When the body is made salt-poor, the hyperchloræmia and hyperosmosis diminish, but the normal values are not reached, although the diuresis is still very high. Fever has but a slight effect on the diuresis, and inhibition of H_2O intake makes the body H_2O-poor, as shown by increased viscosity of the blood and loss of weight, while not notably diminishing the diuresis. The only means by which the capacity of the kidneys can be increased for a time is the subcutaneous or intravenous injection of hypophysis extract, which causes a decrease in H_2O output, a reduction of the hyperchloræmia, and a lessened protein in the blood-serum. However, no significant H_2O retention in the body follows the use of hypophysis extract, for the excretion can be swung from the kidneys to other channels such as the skin. The lessened diuresis and increased concentration of the urine are proportional to the amount of extract administered, and repeated injections of *pituglandol* can cause complete anuria for 9 to 12 hours.—W. D. H. (*Chem. Abstr.*).

476. Diabetes Insipidus in a Baby. S. Narigawa (*Zikwa Zasshi*, 1918, No. 213, 16-26; *Jap. Med. Lit.*, 1920, **5,** 14).—Neither the renal function nor the blood-pressure was disturbed. When pituitary extract was injected in doses of 0·29 c.c., the volume of the urine decreased, and the concentration of its NaCl increased, and the child improved. —W. D. H. (*Chem. Abstr.*).

477. The Anencephalic Syndrome in its Relation to Apituitarism. F. J. Browne (*Edin. Med. J.*, 1920, **25,** 296-307).—In the anencephalic syndrome one sees a maldevelopment of the basis cranii, protruding eyeballs, large amount of subcutaneous fat, hyperplasia of thymus, small or absent adrenals, genital hypoplasia, and stunted growth of trunk and limbs. These appearances are all discussed, and the similarity to dystrophia adiposo-genitalis pointed out. The internal secretions of the mother can play but a minor part in fœtal development, seeing they have no effect in compensating for those wanting in anencephaly. No constant change was noted in thyroid and pancreas.—W. D. H.

478. Effects of X-Ray Treatment of the Hypophysis in Bronchial Asthma. M. Ascoli and A. Fagiuoli (*Endocrin.*, 1920, **4**, 567-73).—The authors have tested the effect of what they call a "stimulating endocrine radio-therapy"—a light application of X rays—in dystrophia adiposo-genitalis, scleroderma, Basedow's disease, and asthma, and claim that the results obtained demonstrate the usefulness of the treatment.—S. V.

479. A Fatal Case of Cardiac Dilation with Associated Gastropathy and Endocrinopathy. C. M. Nice (*Endocrin.*, 1920, **4**, 574-6).—The "endocrinopathy" was connected with the thyroid, and the author suggests that many of the diagnosed anginas and dilatations may arise from thyroid intoxications.—S. V.

480. Herz und innere Secretion. H. Zondek (*Zeitsch. f. klin. Med.*, 1920, **90**, 171-201).—No special changes were found in the circulation apparatus (with the exception of a small dilatation of the heart in some cases) in cases with different forms of adiposity. Sometimes the blood-pressure in the thyreogenic forms is lower, but the heart silhouette and electrocardiogram do not show the character of an hypothyreosis, as in myxœdema.—H. W.

481. Osteomalacia: a Study of the Effects of Certain Organ Extracts and Oöphorectomy on the Metabolism of Calcium and Magnesium. H. A. Freund and B. C. Lockwood (*Annals of Med.*, Hagerston, Md., 1920, **1**, 67-76).—The patient was a woman æt. 33. After a week's control period she was given successively desiccated thyroid in 5 grain doses 3 times daily; pituitrin, 1 c.c. hypodermically twice daily; and, finally, parathyroid extract in 1/10 grain doses, frequency not stated. In each case the gland administration was continued for a week, with rest periods between. Succeeding the parathyroid administration the ovaries were removed, both being cystic. During each period of the study, determinations were made of the Ca and Mg intake and output. There was a marked Ca loss and a minute Mg loss. Most of the calcium was excreted in the urine. During the thyroid administration there was a negative Ca balance of 1·447 grms. as compared with 0·447 during the control period. During the same period there was a negative Mg balance of 0·327 grm. as compared with 0·027. During the pituitrin period the Ca balance was −2·604, and the magnesium balance −0·015. There was thus augmented Ca loss during both the thyroid and the pituitrin periods. The Mg loss was more than 10 times as great during the thyroid as during the normal period. During the pituitrin period there was little change in Mg excretion. During the parathyroid period, on the other hand, there was a marked gain both in Ca and Mg, the balances being positive, 0·616 and 0·775 grm. respectively. After removal of the ovaries there was much greater loss of Ca than during any preceding period. The negative balance for Ca was 5·086, and for Mg 0·291. The castration was not successful in arresting the disease, as is shown both by these figures and by the clinical condition of the patient a year later.—S. V. (*Endocrin.*).

482. The Interstitial Cells and the Ovary. Internal Secretions of the Ovary—I. Ochoterena and E. Ramirez (*Endocrin.*, 1920, **4**, 541-6).—The corpus luteum has a dual origin from the connective and the epithelial tissue. In rabbits and rats the red elements of Della Drips begin to appear as early as the membrana granulosa and discus proligerus stages of development. The secretory activity is manifested, therefore, before the production of the corpus luteum proper. The corpus luteum persists until after parturition. It does not give rise to menstruation, for it succeeds the rutting period. Its secretion depresses menstruation by its antagonistic action on the interstitial tissue of the ovary. The authors have no belief in the existence of a "myometrial gland." The interstitial cells are a constant formation in many animals. The epithelial cells of the gonads, which form a layer in immediate relation with the cœlom, multiply, invade the subjacent connective tissue, some forming oöcytes, others the interstitial cells. These last are the site of a cyclical phenomenon manifested principally by the evolution of

chondriosomes. They are probably concerned in the appearance and conservation of the secondary sexual characters. During menstruation the activity of the mitochondria is clearly evident, characterised by the appearance of chondrioplasts, which in turn give rise to a substance of lipoid nature, which is stained brown by osmic acid. At the termination of the period the chondrioplasts give way to the smaller mitochondria, and there form the starting-point for a new secretory cycle. The secretion of the corpus luteum is antagonistic to that of the interstitial cells. The former has to do with the formation of decidual cells and the nidification of the ovum. After fecundation it assumes relations with the mammary and other glands. When the corpus luteum retrogresses the action of the interstitial tissue is manifested. Its secretion is the determining factor of menstruation.—S. V.

483. The Relation between the Interstitial Cells and the Hypertrophy of the Hypophysis. T. Hayami (*Verhandl. d. jap. path. Gesellsch.*, Tokyo, 1919, 43-4).—In rabbits double castration produced hypertrophy of the pituitary. Castration on one side and vasectomy on the other gave rise to hypophyseal hypertrophy, an almost complete cessation of spermatogenesis, and an increase in the interstitial cells in the remaining testis. Double vasectomy and treatment of the testes with Röntgen rays destroyed the epithelial and Sertoli cells and increased the interstitial cells, which must therefore, in the author's opinion, be responsible for the resultant enlargement of the hypophysis.—S. V. (*Endocrin.*).

484. Pathology of Internal Secretions—II. H. Nakamura (*Verhandl. d. jap. path. Gesellsch.*, 1919, 41-3).—Tying both spermatic cords in rabbits gives rise to an increase in body fat, a reduction in the amount of the interstitial fatty tissue of the thymus and an increase of its lymphatic cortical substance, a colloid type of thyroid, a thickening of the adrenal cortex and an increase in the lipoid content of its cells, an increase of the chromaphil reaction of the medulla, and an increase in the chromophobe cells of the hypophysis. In human subjects from 50 to 90 years of age there is atrophy of the thymus and reduction in size of Hassal's corpuscles, as well as changes in the thyroid and reduction in the adrenal cortex. The author notes also the appearance of brown granular pigment in the posterior pituitary lobe and the disappearance of eosinophile cells from the anterior lobe.—S. V. (*Endocrin.*).

485. Weitere Beiträge zum Studium der Dysfunction endokriner Drüsen in der Schwangerschaft. A. Mahnert (*Arch. f. Gynäkol.*, 1920, **113**, 472-89).—The author proves by means of the micro-Abderhalden reaction of Pregl and de Crinis the formation of "Abwehrfermenten" against the protein of the hypophysis and epiphysis during the period of gestation (in 60 and 40% of the examined cases). A dysfunction of these glands during the pregnancy is therefore plausible. The author has reported in former papers about a dysfunction of the ovary, the thyroid, and the adrenal. The idea is advanced that a common poison is the cause of all these dysfunctions, (the fœtal elements of the placenta).—H. W.

REPRODUCTIVE SYSTEM

486. Loi du " tout ou rien " ou de constance fonctionnelle, relative à l'action du testicule considéré comme glande endocrine. A. Pézard (*Compt. rend.*, 1921, **172**, 89-92).—Subperitoneal grafting of portions of testis in castrated cocks leads to the development of secondary sexual characteristics if the weight of testis implanted is $\frac{1}{2}$ gm. or more. If the graft has a lower weight than this, the animal remains neuter. There is no intermediate state (see also Abstract No. 3575, Vol. V., p. 565).—J. A. M.

487. Temps de latence dans les expériences de transplantation testiculaire et loi du "tout ou rien." A. Pézard (*Compt. rend.*, 1921, **172,** 176-8).—A continuation of previous work (see preceding abstract). After grafting testicular tissue in castrated cocks there is a latent period of 2 to 6 weeks, during which there is no difference between the animals and control cocks which have been castrated without implantation of testicular tissue. Then comes a sudden divergence, and the grafted animals develop secondary sexual characteristics at a rapid rate.—J. A. M.

488. Numerical Law of Regression of Certain Secondary Sex Characters. A. Pézard (*J. Gen. Physiol.*, 1921, **3,** 271-83).—Post-puberal castration in cocks results in a regression of the comb, similar to that effected by castration before puberty. The rate of diminution is represented by a segment of a parabola.—W. M. B.

489. Secondary Sexual Characteristics. A. Pézard (*Endocrin.*, 1920, **4,** 527-40).—The author reviews the results of a previous study and states certain laws relative to the testicular hormone. The maintenance of the characteristics conditioned by the testicle depends on the constant presence of the hormone. A minimal amount of testicular parenchyma suffices to assure development of the characters. There is no relation between the characters and the amount of the gland. The internal secretions may play a part in evolution. Evidence is given for this in the experiments of T. H. Morgan on castrating the Seabright cocks, which then take on the normal plumage, and the feeding experiments of Houssay, in which he found that interesting varieties could be obtained by feeding hens on a meat diet.—W. D. H. (*W. I.*).

490. Das Verhalten des Kerns der mit Radium behandelten Spermatozoen von Cyclops nach der Befruchtung. F. Alverdes (*Arch. f. Entwickl. Mechan.*, 1921, **47,** 375-98).—The author investigated the question whether the double form of the nucleus, which is observed in the first stages of the segmentation of Cyclops, is the real expression of the separation of the paternal and maternal part of the nucleus. The spermatozoa were irradiated with radium bromide. The impregnation and segmentation of ova, impregnated with spermatozoa, which were irradiated for less than 3 days, were normal. The copulation between the nucleus of the ovum and that of the spermatozoon is also normal after irradiation for 13 days. But the later evolution of the ovum showed great disturbances in the division of the paternal part of the nuclei. After irradiation of the male animal for more than 8 days no ovum developed normally.—H. W.

491. The Internal Secretion of the Testis. A. C. Massaglia (*Endocrin.*, 1920, **4,** 547-66).—A study on the change produced in the rooster by castration and by ligature of the ductus deferens, followed by subsequent removal of the testis, brought out the following facts: The Leydig's cells elaborate fatty granules and mitochondria; therefore, they are without doubt secretory in character. Ligature of the ductus deferens is followed by hydropic degeneration, with subsequent atrophy of the seminal epithelium, primary hypertrophy of the interstitial tissue, followed by secondary sclerosis; in the interstitial tissue the Leydig's cells remain normal or are increased; the pituitary body remains normal. These changes produce no alteration in the secondary sexual character. Removal of the testis after the modification just described is followed by change in the secondary sexual character typical of castration, and by a marked hypertrophy of the pituitary body and a remarkable increase in the number of eosinophilic cells of that organ. This change is similar to the change observed in the pituitary body of castrated roosters. From these facts the conclusions seem warranted: (*a*) The testis has an internal secretion which gives sexual character and instincts; (*b*) the Leydig's cells of all the cellular elements of the organ exercise the endocrinous function.—W. D. H.

492. L'implantation de glandes sexuelles. G. F. Lydston (*Arch. med. belges*, 1920 **73,** 909-15).—The author claims priority over Steinach and Voronoff in the utilisation of testicular grafts as a rational therapeutic measure. His patients seemed to be much

younger (about 35) than those treated by Voronoff; they generally showed a eunuchnoid condition coupled with some degree of mental depression. Notes of cases and the most suitable source of grafts (cases of accidental death, gas or toxic poisoning, drowning, and executed criminals) are given.—R. K. S. L.

493. Die Sterilisierung des weiblichen Tierkörpers durch parenterale Spermazufuhr. R. Dittler (*Münch. med. Woch.*, 1920, **67,** 1495-7; *Zeit. Biol.*, 1920, **72,** 273-304).—Injections of spermatozoa obtained fresh from a male rabbit were made into the ear vein of a female rabbit. This female rabbit, previously fertile, then became sterile towards the same male rabbit for a period of about 4 months. Human spermatozoa had no such effect. Similar injections did not interfere with ovulation, or with the course of pregnancy.—J. H. B.

494. Parthenogenesis in the Water Vole. G. S. Sansom (*J. Anat.*, 1920, **55,** 68-77).—The title is given for those interested. The paper is well illustrated with plates, and the general conclusion that parthenogenesis does occur to a limited extent in *Microtus amphibius* mainly rests on a study of the ovary.—W. D. H.

495. Cytological Problems and Artificial Parthenogenesis. D. W. Cutler (*Sci. Progress*, 1921, **15,** 435-44).—Those who have not read Prof. Doncaster's book on cytology and sex determination will find here an excellent account of modern work of a fascinating character on the cell chromosomes, and the possibility that sex may be determined by the extra chromosomes known as sex chromosomes.—W. D. H.

496. Reproduction sexuée et reproduction asexuée. A. Malaquin (*Compt. rend.*, 1920, **171,** 1403-6).—In *Salmacina dysteri* (Huxley) the determination of sexual or asexual reproduction is not to be found in the medium in which the animals grow, the food supply, or temperature, but must be sought in the functional correlation of the organism. —J. A. M.

497. Über einige Fälle von Hermaphroditismus mit besonderer Berücksichtigung der Zwischenzellen. H. v. Keussler (*Beitr. z. path. Anat. u. allgem. Path.*, 1920, **67,** 416-36).—The author investigated the case of an external female hermaphrodite with testes and distinctly developed seminal tubes and interstitial cells, and he concludes that the interstitial cells (puberty gland of Steinach) have no relation to the secondary sexual characters. This, together with 2 other similar cases, he considers to be a refutation of Steinach's views.—H. W.

498. Über die innere Sekretion der Ovarien und die funktionellen Uterusblutungen. H. Meyer-Ruegg (*Schweiz. med. Woch.*, 1920, **50,** 241-8).—Attention is called to the numerous factors, endocrine and nervous, which affect the activities of the uterus in addition to the chief controlling influence exerted by the ovary.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

499. Der Bauplan der Keimdrüsen. A. Kohn (*Arch. f. Entwickl. mechan.*, 1920, **47,** 95-118).—The author propounds the idea that the interstitial cells of the sex glands are chiefly trophic organs, to assist the function of the generative system.—H. W.

500. Origin of the Corpus Luteum. T. Hirose (*Tokyo Igakkwai*, 1920, **34** (No. 2).—The author concludes from microscopic study that the lutein cells and the interstitial cells arise from the cells of the theca interna.—S. V. (*Endocrin.*).

501. Menstrual Fluid. J. Oliver (*N.Y. Med. J.*, 1920, **112,** 751-2).—70 ounces of menstrual fluid were collected from a case of imperforate hymen. The fluid was of uniform consistence. It was faintly alkaline, of 1·031 sp. gr.: H_2O 87·13%. The solids were 95·02% organic material and 4·98% ash. Serum albumin was 12·49, serum globulin 16·56, mucin 3·37, and fat 0·0051%. The ash contained Na, K, Ca, Mg. P, and Fe, and the salts present were principally NaCl, Na_2CO_3, with small amounts of phosphates and sulphates. No iodine could be detected. From this analysis the author is inclined to the secretory conception of menstruation.—W. D. H.

502. Über Ovulation, Corpus Luteum und Menstruation. F. Tschirdewahn (*Zeitsch. f. Geburtshife und Gynäkol.*, 1920, **83,** 80-113).—The author gives first a summary of the theories about the signification of the corpus luteum for menstruation. He publishes then 80 cases of laparotomy, in which the ovaries and the corpora lutea were observed and the time of the last and the following menstruations was fixed. The results of his own observations and of the literature are the following: 1, rarely 2 follicles reach maturity in every ovulation period. The rupture of the follicle occurs with individual differences (also with the same person) between the 10th to 26th day after the last menstruation. The transformation of the follicle into the corpus luteum takes place during the wandering of the ovum through the tube. The hormones of the corpus luteum effect the changes of the mucous membrane of the uterus into the pregravid or premenstrual state. If an impregnation has occurred, the corpus luteum assists in the stimulation of the developing ovum. This corpus luteum takes care of the special nutrition of the uterus and its content during the first part of gravidity. If the ovum is not impregnated, regression of the corpus luteum occurs, the uterus does not receive further impulses to remain in its pregravid state, and the mucous membrane degenerates. This degeneration is menstruation. The maturity of the follicles, which was inhibited during the formation of the corpus luteum, can begin anew.—H. W.

503. Das Menstrualblut. M. Stickel and B. Zondek (*Zeitsch. f. Geburtshife und Gynäkol.*, 1920, **83,** 1-26).—No influence on the blood-corpuscles and on their hæmoglobin content in the whole blood during menstruation could be detected. The menstrual blood shows an oligocythæmia and leukopenia. The colour index is not reduced in proportion, because partial hæmolysis of the uterine blood occurs. In the whole blood the lymphocytes increase during menstruation, and especially in the uterine blood. The total solids, and also their molecular concentration, are diminished in the menstrual blood. No changes in the toxicity of the red cells and percentage of proteins were found. Hæmolysis is probably the effect of an enzyme from the uterine mucous membrane. No changes of coagulation were observed in the whole blood, but menstrual blood does not clot. This inhibition of coagulation is also caused by a substance in the mucous membrane. Blood obtained by puncture of the uterus during menstruation clots normally. Apparent blood-clots in menstrual blood are caused by sedimentation of the blood-corpuscles.—H. W.

504. Creatinine and Creatine in the Blood. C. C. Wang and M. L. Deutler (*J. Biol. Chem.*, 1920, **45,** 237-43).—No regular variation in the creatinine and creatine of the blood was observed during menstruation.—J. C. D.

505. Die Beziehungen der Senkungsgeschwindigkeiten der roten Blutkörperchen zum im Blutplasma vorhandenen dialysierbaren Verbindungen. Beziehungen zu den Abwehrfermenten. E. Abderhalden (*Fermentforschung*, 1921, **4,** 230-41).—Substances are present in the plasma of pregnant women which increase the rapidity of sedimentation of red cells. Blood-corpuscles of normal persons sedimentate quickly in the plasma of a pregnant person; the cells of pregnant women sedimentate slowly in normal plasma. The substance (cleavage product ?) passes through a dialyser. Addition of "placenta peptone" to the blood of pregnancy has an accelerating influence, but not the addition of alanine or glycine.—H. W.

506. Übergang der sogenannten diffusiblen Serumsalze durch die Placenta von der Mutter auf das Kind. F. Edelstein and A. Jippö (*Zeitsch. f. Kinderheilk.*, 1920, **27,** 79-91).—The passage of diffusible serum salts united to protein through the placenta does not follow osmotic laws. A "vital" action of the cells of the placenta plays the chief part. The content of these serum salts is greater in the blood of the fœtus than in the maternal blood. On the other hand, the quantity of substances soluble in

alcohol is greater in the maternal serum than in that of the fœtus; the maternal blood has the greater quantity of residual nitrogen.—H. W.

507. The "Ammonia Coefficient" of Pregnancy. W. C. Cullis and E. E. Hewer (*Biochem. J.*, 1920, **14,** 757-61).—A case admitted to hospital for vomiting of pregnancy showed an "ammonia coefficient" of 70. She was put on a diet containing much protein, and the "coefficient" fell. After parturition her "ammonia coefficient" was normal. There was no relation between "ammonia coefficient" and the total ammonia, nor between vomiting and high "ammonia coefficient."—H. E. R.

508. Disturbances in the Development of Mammalian Embryos caused by Radium Emanation. J. F. Gudernatsch and H. J. Bagg (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 183-7).—Radium emanation, carried in a very small amount of saline solution, was injected in measured quantities into pregnant rats. This was sometimes followed by death and absorption of the fœtus, but the most characteristic effect was the appearance of extravasations of blood, chiefly into the subcutaneous connective tissue. There were no obvious effects on the maternal tissues.—D. H. de S.

PHARMACOLOGY

509. Further Observations on the Relation between Chemical Constitution and Antiseptic Action. C. H. Browning, J. B. Cohen, and R. Gulbransen (*J. of Path. and Bact.*, 1921, **24,** 127-8).—The authors have tested the antiseptic properties of fragments of the acridine molecule; all the compounds tested were found to be inferior to diaminoacridine. The methyl group of diaminoacridine methochloride was replaced by other alkyl radicles, and the different compounds tested; the antiseptic power of these com pounds was found to be practically identical with that of the methochloride. The introduction of alkyl radicles into the amino groups decreases antiseptic power.—W. E. G.

510. Local Anæsthetics. L. Launoy and Y. Fujimori (*Compt. rend. soc. biol.*, 1919, **82,** 732-6).—The toxic and anæsthetic powers of certain amino-alcohols are increased by benzoylation, even more than by phenylation. The greatest activity is seen in C_5 derivatives. Hæmolytic action is distinct with C_5, but is more pronounced with increase in molecular weight.—W. D. H. (*J. C. Soc.*).

511. Theorie der Narkose durch Inhalationsanästhetika. K. H. Meyer and H. Gottlieb-Billroth (*Zeit. physiol. Chem.*, 1921, **112,** 55-79).—The "lipoid theory of narcosis" is supported. It is held that narcosis is produced when the anæsthetic reaches a definite molar concentration in the cell lipoid. This "critical concentration" depends on the kind of animal and cell involved, but in general is independent of the properties of the narcotic. Since substances differing widely in chemical constitution act similarly as narcotics, this action must be physical and not chemical. It is assumed that the changes in the cell lipoid are produced by equimolecular solutions of the anæsthetic, just as the freezing-point of a liquid is depressed to the same extent by the addition of equimolecular proportions of different solutes.—H. W. D.

512. Theorie der Narkose durch Inhalationsanästhetica. K. H. Meyer and H. Gottlieb-Billroth (*Münch. med. Woch.*, 1921, **68,** 8-10).—Evidence of the connection between power to produce anæsthesia and solubility in lipoids is given. The authors lay down the rule that any chemically indifferent substances which produce anæsthesia when inhaled will produce it so soon as they reach a concentration in the brain lipoids of about 0·06 molar per litre.—J. H. B.

513. Allgemeinnarkose bei relativer Blutleere des Gehirns. K. Hoffmann (*Münch. med. Woch.*, 1920, **67,** 1065-7).—The production of general anæsthesia depends on a fall of blood-pressure in the brain. To obtain this, the subject to be anæsthetised should

begin a series of forced deep respirations. A very small amount of chloroform quickly applied then produces anæsthesia.—J. H. B.

514. Synergistic Colonic Analgesia. J. T. Gwathmey (*J. Amer. Med. Assoc.*, 1921, **76,** 222-5).—The advantages of oil-ether colonic anæsthesia are detailed. If $\frac{1}{8}$ gr. of morphine with 2 c.c. of 25% $MgSO_4$ is given hypodermically 2 hours before operation, and twice repeated at half-hour intervals, the amounts of oil-ether or N_2O—O_2 required to produce analgesia with unconsciousness are much reduced.—C. L. E.

515. Alcohol und Prazisionsarbeit. U. Jöttermann (*Skand. Arch. f. Physiol.*, 1920, **40,** 107-16).—The index of skill was the number of needles which could be threaded with cotton in 20 minutes. The subject (the author) had abstained from alcohol for 6 months beforehand. During a preliminary period of 14 days without alcohol the daily score of needles rose to a steady maximum. He then began to take 25 c.c. of pure alcohol, diluted to 100 c.c. with water, daily at 11 p.m., the experiments being made daily at about 10 a.m. During the first few days of alcohol the score rose slightly, then fell off distinctly. It rose again during a second period without alcohol, and fell again during a second period with it. He concludes that, apart from its immediate effect, which was excluded by the interval between drinking and threading, a daily small ration of alcohol diminishes his efficiency in skilled work. The experiments are few, and the subject admits that he may be abnormally susceptible.—H. H. D.

516. Die kombinierte Röntgen-Radiumbehandlung im Rahmen der biologischen Dosierung. L. Seitz and H. Wintz (*Zentralb. f. Gynäk.*, 1920, **44,** 529-36).—A method for the quantitative estimation of the biological effects of radium; one "unit dose" produces a reddening of the skin in 8 days, and a light bronzing in 4 to 5 weeks. The absorption by the tissues of the radiations from preparations of various strengths is measured in terms of this biological unit.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

517. Über den Einfluss der Röntgenstrahlen auf den Uterus der weissen Maus. Zugleich ein Beitrag zur Histologie der Strahlenwirkung überhaupt. L. Nürnberger (*Strahlentherapie*, 1920, **10,** 874-82).—Four weeks after the irradiation the generative organs were fixed in Carnoy's fluid, sectioned in paraffin, and stained with methyl green pyronin orange. The uterine epithelium was found to be increased in thickness and to possess an abnormally large number of layers of nuclei. Cell outline and basement membrane had, however, become indistinct. After 6 to 8 weeks the uterine epithelium returned to its normal condition. The degenerative changes in the nuclei were investigated in the ovary of mouse and guinea-pig. As a result of the X-ray treatment the chromatin lost its staining properties and the nucleus became spherical and homogeneous. Similar changes were observed in nuclei of other tissues. In the musculature certain "pyroninophil" cells seem to be particularly affected by the treatment (see also Abstract No. 3580, Vol. V., p. 565).—T. R. P. (*Ber. ü. d. ges. Physiol.*).

518. Die Wirkung des ultravioletten Lichtes auf die inneren Organe mit Eosin sensibilisierter Mäuse. R. Gassul (*Strahlentherapie*, 1920, **10,** 1162-71).—Subcutaneous injection of eosin renders the animal body more sensitive to ultra-violet rays, so that the time required to produce an effect with a given intensity of radiation may be reduced to as little as a quarter of the time required in the absence of the dye. Descriptions of the histological changes produced in the liver, spleen, kidney, and lung of the sensitised animal are given, together with control experiments which show that the eosin alone is without effect.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

519. Über Milzbestrahlung bei Hämophilie. H. Neuffer (*Münch. med. Woch.*, 1921, **68,** 40).—Illumination of the spleen with X rays is a valuable therapeutic agent in cases of hæmophilia in which the delay in blood-clotting is not too great.—J. H. B.

520. Über paradoxe Wirkungen von Herzgiften und ihre Ursachen. E. P. Pick (*Wiener klin. Woch.*, 1920, **38,** 1081-5).—Fluctuations in the tonus of the vagus sym-

pathetic nerves change the irritability of the heart for the different drugs. Their effect can be reversed.—H. W.

521. The Present Status of Digitalis Therapy. D. Luten (*J. Amer. Med. Assoc.*, 1921, **76**, 26-8).—Review of literature. The conclusion is that, when given clinically, digitalis stimulates the vagi, and also has some action, imperfectly understood, on heart muscle.—C. L. E.

522. Über den Einfluss der Digitaliskörper auf die Bildung und Fortleitung der Kontractionswelle im Froschherzen. H. Schönleber (*Arch. exp. Path. Pharm.*, 1920, **87**, 356-76).—H. W.

523. Chemie und Pharmakologie des Digitoxins. M. Cloetta (*Arch. exp. Path. Pharm.*, 1920, **88**, 113-57).—A method for the preparation of pure digitoxin from digitalis leaves is given. It is crystalline, and has the formula $C_{44}H_{70}O_{14}$. Many other chemical details are given, and the preparation of benzoyl, acetyl, etc., derivatives is described. Its action on the heart depends on its OH groups; replacement of these by other radicles weakens or annuls its activity.—W. D. H.

524. The Action of Adonis vernalis. J. M. Schmidt (*Amer. J. Pharm.*, 1920, **92**, 702-14).—*Adonis vernalis* stimulates the heart in a manner very similar to digitalis; if large doses are administered, a rise in pressure is caused, mainly by the action of the drug upon the bloodvessels; that it is less irritating than digitalis, and possesses less tendency to produce gastric disturbance.—W. D. H. (*Chem. Abstr.*).

525. Über periodische Chininwirkung. H. Schulz (*Zntrlbl. f. Physiol.*, 1920, **34**, 415-9).—Periodicity in the rate of fermentation of sugar by yeast in presence of quinine (1: 250-300) is noted.—C. L. E.

526. Action of Quinine on the Pregnant Uterus. H. W. Acton (*Lancet*, 1921, i., 216-8).—Experiments on the rat and guinea-pig show that quinine in certain concentrations causes contraction of the circular and longitudinal muscular fibres of the uterus, and in the human subject may lead to miscarriage. Full details of doses, etc., are given. Care in dosing pregnant women with quinine is therefore necessary.—W. D. H.

527. The Influence of Phenylcinchoninic Acid and its Methyl Derivative on the Uric Acid and Urea of the Blood. V. C. Myers, J. A. Killian, and G. E. Simpson (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 187-9).—Reports on two cases in which these substances were given show diminution of the uric acid and urea of the blood.—D. H. de S.

528. Über gefässerweiternde Wirkung des Chinins. R. Latzel (*Wiener klin. Woch.*, 1921, No. 3, 21-2).—Quinine (bichloride or bisulphate) 10% given intravenously has a dilator effect on contracted bloodvessels, especially in pathological cases.—H. W.

529. Über die Wirkungen des Chitenins und Cinchotenins. M. Dauber (*Zeit. exp. Path. Ther.*, 1920, **21**, 307-18).—The first-named substance has a specific noxious effect on the kidneys of rabbits. The parasiticide effect of quinine is only observed in slight degree. The same is the case with the effect on the central nervous system and on the circulation. On the isolated uterus a relaxing effect was seen. The second substance is almost innocuous to cold or warm-blooded animals.—H. W.

530. Die pharmakologische Wirkung von Vuzin und Eukupin. U. G. Bylsma (*Zeitsch. f. d. ges. exp. Med.*, 1920, **11B**, 257-336).—Extended and exact investigations of the pharmacological effects of vuzin (isoctylhydrocuprein) and eukupin (isoamylhydrocuprein) in very many directions. These effects correspond for the greater part to the effects of quinine hydrochloride.—H. W.

531. Über das Minutenvolum des Herzes beim Hunde und den Einfluss des Coffeins. J. Bock and J. Bachholtz (*Arch. exp. Path. Pharm.*, 1920, **88**, 192-205).—Even large doses producing profound effects otherwise have no influence on the heart.—W. D. H.

532. The Action of Opium on the Intestine. F. Uhlmann and J. Abelin (*Zeit. exp. Path. Ther.*, 1920, **21,** 58-74).—The response of the intestine to the drugs in the living animal was studied; the isolated intestine often behaves otherwise. The circular and longitudinal musculature of the small intestine are qualitatively similarly affected. In small doses opium retards peristalsis, in large it acts as a stimulus, and in very large amounts produces first a maximum stimulation and then inhibition. The pendular movements of the isolated segment can only be influenced by large doses, and they are retarded.—W. D. H.

533. Stoffwechselversuche am Hunden während der Gewöhnung an Morphin und während Morphinhunger. K. Schübel (*Arch. exp. Path. Pharm.*, 1920, **88,** 1-29).—During the time that dogs are being accustomed to morphine administration and during morphine hunger they show signs of altered metabolism, of which the main cause is gastro-intestinal mischief. A marked feature is increased excretion of purine bases and P_2O_5. There are also changes in the central nervous system and signs that the cells there break down. This is specially seen when the morphine is suddenly stopped. —W. D. H.

534. Pharmacology of Chelidonin, a Neglected Alkaloid of Chelidonium, or Tetterwort. P. J. Hanzlik (*J. Amer. Med. Assoc.*, 1920, **75,** 1324-5).—This resembles papaverine and the benzyl esters, but differs from morphine in several particulars.—C. L. E.

535. Über den Einfluss von Adrenalin und Pilokarpin auf den Kalkumsatz im Säuglingsalter. E. Schiff and A. Peiper (*Jahrb. f. Kinderheilk.*, 1920, **93,** 160-6).—In 3 cases out of 4 subcutaneous administration of adrenaline increased the Ca excretion, while pilocarpine had no effect.—C. L. E.

536. Über einen Antagonismus zwischen Pilokarpin und Adrenalin. E. Billigheimer (*Arch. exp. Path. Pharm.*, 1920, **88,** 172-8).—Spontaneous sweating is inhibited by adrenaline, and sweating is only with difficulty produced by pilocarpine in men previously treated with adrenaline.—W. D. H.

537. Pharmacologische Wirkungen am peripherer Gefässapparat und ihre Beeinflussung auf Grund einer spezifishen Veränderung der Permeabilität der Zellmembranen durch Hydroxylionen. W. Jacobj (*Arch. exp. Path. Pharm.*, 1920, **88,** 333-63).—The absorption of strychnine and adrenaline through the frog's web is increased by veronal sodium locally applied. Most of the paper deals with adrenaline. The veronal sodium increases the permeability of the epidermis, and so affords a more ready passage to the alkaloids. In solution "veronal sodium" ionises, and the increase of permeability is more than is produced by a corresponding concentration of OH-ions, so probably the veronal component is itself active in the same direction. The effect is reversible, and no doubt the solubility of veronal in the lipoids of the cell membrane is a factor of importance. Saponin is hæmolytic, and increases permeability in a similar way, except that there OH-ions are not concerned. The important general question of the rôle played in normal life in this direction by OH-ions is opened up, and shortly referred to.—W. D. H.

538. Adrénaline et quinine : leur antagonisme. A. Clerc and C. Pezzi (*J. de physiol. et de pathol. gén.*, 1920, **18,** 1174-81).—This antagonism is expressed in several ways. Adrenaline excites the vagus centre, the heart muscle, and raises the arterial pressure. Quinine has opposite effects in all cases. It really constricts the bloodvessels, however, but its depressant action on the heart overpowers the result on the blood-pressure.—W. M. B.

539. Pharmacology of Cotton Root Bark. C. R. Eckler (*Lilly Sci. Bull.*, 1920, **1,** 349-68).—Tests of activity were made on many samples. In a few cases large doses produced a very slight blueing of the cock's comb; this method yielded indefinite results, and, as a rule, no decided differences could be detected between any of the samples

examined. A very slight and transient pressor effect was produced on the blood-pressure of the dog; a depressor effect, or no effect, was obtained on the intact cat. No difference between any of the samples was found by the blood-pressure method. Rather large doses produced small contractions of the uterus. All the methods showed that the activity of cotton root bark was not comparable to that of ergot.—W. D. H. (*Chem. Abstr.*).

540. Über die Wirkungen des d- l- und i-Kampfer—IV. G. Joachimoglu (*Arch. exp. Path. Pharm.*, 1920, **88**, 364-70).—Aqueous solutions of camphor (1 : 1,000 to 5,000) increase the tone and rhythmic contractions of the smooth muscle of the leech, thus resembling santonin. The 3 isomerides act precisely alike. Ba increases the action. It acts probably on the muscle itself, not on nerve endings. Thymol acts like camphor. The use of camphor and thymol as clysters against parasitic worms is suggested.—W. D. H.

541. A Comparison of the Action of Benzene and Cyclohexane on the Formed Elements of the Blood. L. Launoy and Lévy-Bruhl (*Bull. soc. chim. biol.*, 1920, **2**, 145-9).—Cyclohexane is markedly less toxic than benzene.—J. C. D.

542. The Carminative Volatile Oils and the Movements of the Intestine. O. H. Plant (*J. Pharm. Expt. Ther.*, 1920, **16**, 311-25).—These oils increase the movements of the intestine of unanæsthetised dogs when applied to the mucous membrane in dilute solutions. There is increase in tone and rhythm, and peristalsis occurs. The primary increase in activity may be followed by a decrease in tone and amplitude of contractions. The effects are lessened, but not abolished, by atropine. They are abolished by cocaine. Small doses of morphine, which increase the muscular activity of the intestine of dogs, do not influence the effect produced by volatile oils. These carminative oils can be roughly classed into 2 groups: the stronger members include mustard, cinnamon, peppermint, cloves, nutmeg, spearmint, juniper, and lavender; the weaker include anise, cardamom, fennel, orange, and carraway.—E. M.

543. Tissue Storage of Salicylates, Guaiacol, and Pyrocatecholacetic Acid. Jurgens (*Zeit. exp. Path. Ther.*, 1920, **21**, 213-5).—It was found that the blood always contained the drugs in considerable amounts. After administration the kidneys came next in relative amount and frequency of positive reaction. The joints more than the muscles appeared to have a selective affinity for the salicylate, but the respiratory organs also contained not a little. Guaiacol was always found in the respiratory organs, but never in the muscles or joints. Similar findings in general were obtained with K pyrocatecholacetate.—W. D. H. (*Chem. Abstr.*).

544. Sull' azione anticoagulante dell' Ittiolo. A. Chistoni (*Arch. farm. sper.*, 1920, **18**, 125-8, 129-38).—It is concluded that the anticoagulant action of ichthyol is complex, and depends on a precipitation of the Ca salts and on a deleterious action on the platelets and thrombin. The gradual loss of coagulability of the blood was followed in the living animal after subcutaneous injections of known amounts of the drug.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

545. Pharmacological Study of Benzyl Benzoate. E. C. Mason (*J. Lab. and Clin. Med.*, 1920, **6**, 62-77).—A solution of benzyl benzoate, injected into the vein of a dog, produces a fall in blood-pressure due to slowing and weakening of the heart, which tends to stop in diastole. Non-poisonous doses have a very slight inhibitory effect on pyloric contractions, and lower the tone of the intestinal muscle to a small extent. They do not cause broncho-dilatation, nor do they appreciably affect the pressure in the pulmonary artery. From this it would seem that the drug is of no use in the treatment of hæmoptysis in pulmonary tuberculosis.—D. H. de S.

546. Experimentelle Studien über Diffusion durch die Hornhaut. Diffusion und Iontophorese des Optochin und Zinksulfats. M. Goldschmidt (*Arch. f. Ophthalm.*, 1920, **103**, 280-91).—The celerity of diffusion of zinc is doubled under the influence of the

electric current. The iontophoresis (cataphoresis) with optochin is 140 times more rapid than diffusion (investigations on the cornea of a bullock).—H. W.

547. Absorption and Elimination of Manganese Ingested as Oxides and Silicates. C. K. Reiman and A. S. Minot (*J. Biol. Chem.*, 1920, **45,** 133-43).—Ores containing manganese oxides and silicates are soluble in the gastric juice. Absorbed manganese is soon eliminated, and no pathological symptoms were observed to follow manganese administration even when prolonged.—J. C. D.

548. Über die pharmakologischen Wirkungen des defibrinierten Blutes—II. H. Freund (*Arch. exp. Path. Pharm.*, 1920, **88,** 39-79).—The defibrinated blood, even the animal's own blood, exerts a toxic action. The coagulability of the blood is not affected; there is a rise of body temperature of central origin, a dissolving action on the corpuscles (especially the platelets), and varying effects on heart, bloodvessels, and uterus; the difference is attributed to there being several poisons, some of which develop early, others later, after defibrination. Some of the effects are explained as of central, others of peripheral action. Experiments on rabbits and cats.—W. D. H.

TOXICOLOGY

549. I. Chronic Intoxication in Rats. T. Sollmann, O. H. Schettler, and N. C. Wetzel (*J. Pharm. Expt. Ther.*, 1920, **16,** 273-90). **II. Alcohols and Acetone.** T. Sollmann (*ibid.*, 291-310).—I. A description is given of the care, feeding, and rates of growth of normal rats under experimental conditions, and standards are worked out for determining whether results are abnormal. II. It was found that the continuous consumption of ethyl alcohol (2·7 to 9·4 c.c. per kilo daily) by rats interfered with their growth and diminished the consumption of food. However, little or no mortality occurred even after months of taking this substance in 2·5% solution. Methyl and wood alcohols and acetone were much more toxic. Wood alcohol was less toxic than pure methyl alcohol.—E. M.

550. Comparative Toxicity of some Alcohols. D. I. Macht (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 214).—The secondary alcohols are less poisonous than the primary ones.—D. H. de S.

551. Über die Störung der Wärmeregulation durch Kollapsmachende Gifte. E. Diehl (*Arch. exp. Path. Pharm.*, 1920, **87,** 206-25).—The temperature of the body decreases quickly and considerably before the blood-pressure shows any change. This phenomenon is caused by a direct pernicious influence on the heat centres by poisons which lead to collapse. The diminution of the blood-pressure is independent of the depression of temperature. A central disturbance of heat regulation was observed as an effect of dysentery toxin, while the peripheral apparatus remained intact. This central disturbance, however, only relates to the regulation against cooling; the regulation against overheating is preserved.—H. W.

552. Poisoning by Methyl Bromide. W. Löffler and W. Rütimeyer (*Vierteljahr. ger. Med.*, 1920, **60,** 60-7).—Clinical report of a case of fatal poisoning by CH_3Br. Analysis of the fresh blood and urine before death showed no traces of the toxic compound, nor could any be found in the brain or liver at autopsy. However, when guinea-pigs were poisoned with CH_3Br, positive reactions were usually found in the tissues examined. When the animals were so poisoned that they lived and *breathed* for some time after the administration of the vapour, no traces of the CH_3Br could be found in the tissues. —W. D. H. (*Chem. Abstr.*).

553. The Action of the Corrosive Esters, particularly the War Gases. C. Wachtel (*Zeit. exp. Path. Ther.*, 1920, **21,** 1-18).—Studies with kymograph tracings of the effects of various esters on the blood-pressure and respiration of rabbits showed that the

functional alterations which are induced by the alkyl esters of the mineral acids, of H_2CO_3, and the organic acids studied consist of a slower and shallower breathing accompanied by a pronounced drop in blood-pressure. Convulsions are caused by the action of the esters of the mineral acids on the nervous system, while the H_2CO_3 esters and those of the organic acids bring on a more or less variable narcosis. When Me_2SO_4, Et_2SO_4, or Et bromoacetate are inhaled, 3 typical forms of response are elicited.—W. D. H. (*Chem. Abstr.*).

554. Action of Long-continued Aniline Inhalation. R. Jaffé (*Centr. allgem. Path. u. path. Anat.*, 1920, **31,** 57-63).—The animals (rats and rabbits) lived on an average 6 months after continuous inhalation of aniline, toluidine, and naphthylamine vapours. One animal lived for 1 year and 4 months. In no case was there the development of a tumour in the bladder. The lungs showed the most changes—hyperemia, bronchitis, and finally broncho-pneumonia. In a few cases fatty changes in the kidney epithelium and myocardium were found. In the liver, the aniline and toluidine animals showed fatty changes, the naphthylamine ones necrosis, regeneration, connective tissue increases, and round-cell infiltration. The findings in the liver, as also shown in experimental cirrhosis, seem to indicate that aniline belongs to the poisons that injure the blood directly. This is shown by the iron pigment in the spleen and the masses of iron in the Kupffer cells of the liver. It would be interesting to see if true cirrhosis of the liver occurs often in workers with aniline.—W. D. H. (*Chem. Abstr.*).

555. Sur la toxicité des carbonates et chlorocarbonates de méthyle chlorés. A. Mayer, H. Magne, and L. Plantefol (*Compt. rend.*, 1921, **172,** 135-9).—Broadly speaking, the toxic action of these substances is directly proportional to their chlorine content.—J. A. M.

556. Sur l'intoxication par les méthanes nitrohalogénés. A. Mayer, L. Plantefol, and F. Vlès (*Compt. rend.*, 1920, **171,** 1396-7).—Inhalation of dichlorodinitromethane leads to death from œdema of the lungs, as is the case with chlorpicrin. When either of these gases is injected into the peritoneal cavity it produces a fatal result. In these circumstances, chlorpicrin causes a slight, dichlorodinitromethane a large, transformation of blood-pigment into methæmoglobin.—J. A. M.

557. Toxicity and Irritant Effect of Derivatives of Dichlorethyl Sulphide. E. K. Marshall, Jr., and J. W. Williams (*J. Pharm. Expt. Ther.*, 1920, **16,** 259-72).—As regards substitution compounds of mustard gas, it was found in general that compounds containing halogen were the most toxic, and that those containing aliphatic radicals in place of the chlorine were more toxic than those containing aromatic nuclei. The effect of dichlorethyl sulphone on the skin was of the same order as dichlorethyl sulphide, while dichlorethyl sulphoxide was practically inert. The latter does not hydrolyse in weak alkali.—E. M.

558. Über den Synergismus von Giften. V. Guanidin, Baryt. H. Fühner (*Arch. exp. Path. Pharm.*, 1920, **88,** 178-91).—$BaCl_2$ and guanidine salts both produce irregular twitchings in the gastrocnemius and foot of isolated frog's legs. Both stimulate motor nerve endings, and Ba seems also to have a direct effect on the substance of the muscle fibres. In the case of guanidine this effect is followed by one resembling that caused by curare. The result of mixing the 2 substances is to double the effect.—W. D. H.

559. Zur Kenntnis der Gewöhnung. IV. Über Gewöhnung an Kodeinderivate (Eukodal u. Parakodin). J. Biberfeld (*Biochem. Zeit.*, 1920, **111,** 91-104).—Eucodal has a greater paralysing effect upon respiration than has morphine, but it is less toxic than heroine. Narcosis is deeper, but passes off sooner. Rabbits do not acquire tolerance, but dogs soon cease to be influenced by the drug as a soporific. Paracodin acts more strongly than codeine upon respiration, but is weaker than eucodal and morphine.—E. C. G.

560. Zur Frage der Lokalisation und Erklärung einiger spezifischer Nerven- und Muskelgiftwirkungen. C. Jacobj (*Münch. med. Woch.*, 1921, **68,** 37-9).—The author puts forward the view that a medullated nerve consists of an axis cylinder surrounded by a " semipermeable " layer of lecithin, the whole of which is insulated by a coat of cholesterol. At the nerve ending, where the semipermeable layer is unprotected, the lecithin is dissociated on excitation, and phosphoric acid is free to act as a haptophore group for suitable poisons. Such are a whole series of ammonia derivatives (*e.g.*, tetraethyl ammonium iodide), which have a curare action. When the basic part of the poison is fixed to the phosphoric acid of the lecithin, the halogen-ion or hydroxyl left enters the axis cylinder and neutralises the H-ions there. The muscle is then curarised. —J. H. B.

561. Über die Vergiftung durch Pilze aus der Gattung Inocybe. C. Fahrig (*Arch. exp. Path. Pharm.*, 1920, **88,** 227-45).—*I. mimosa, frumentacea, sambucina, infida,* and *repanda* are all fungi which yield muscarine. Cases of poisoning in man (some fatal) and experiments on cats are described. Pictures of these dangerous mushrooms are appended. —W. D. H.

562. Beiträge zur Muscarin-Frage. II. Über Pseudomuscarin. A. B. Weinhagen (*Zeit. physiol. Chem.*, 1920, **112,** 13-27).—It is shown that the action of HNO_2 on choline chloroplatinate gives rise, not only to the nitrous acid ester of choline, but also to a number of other compounds. By altering the conditions of the reaction a substance is produced (nitrous acid ester of aminoethyl alcohol ?) which has a pharmacological action antagonistic to that of " pseudomuscarine." The presence of subsidiary products of the reaction may account for the lack of agreement with respect to the physiological activity of " synthetic muscarine."—H. W. D.

563. Über einige methylierte Aminosäuren und methylierte Aporrhegmen sowie ihr Verhalten im Tierkörper. D. Ackermann and F. Kutscher (*Zeit. Biol.*, 1920, **72,** 177-86).—A series of amino-acids and of apporrhegma (biological " amino-acids ") were submitted to a total methylation. The substances were isolated and analysed (as aurates), and then examined in animal experiments. The " curare " effect of all aporrhegma proved the well-known fact that quaternary ammonium bases paralyse motor nerve endings. All of these substances showed a great resistance against the decomposing power of living cells.—H. W.

564. Adsorption von Giften an Bestandtheile des tierischen Körpers—I. W. S. v. Leeuwen and L. Eerland (*Arch. exp. Path. Pharm.*, 1920, **88,** 287-303).—The present experiments relate to cocaine and its unions with serum and brain substance, the addition of which (also of lecithin and ether extract of dried cat's brain) inhibit its activity. The materials added have in themselves no harmful effects on frog's nerves. The compounds they form with cocaine is the result of a physical as opposed to a chemical union, and dissociation without loss of the alkaloid is obtained by the use of HCl and alcohol.—W. D. H.

565. Experimentelle Beeinflussung der Empfindlichkeit verschiedener Tiere und überlebender Organe für Gifte. (I.) W. S. v. Leeuwen and C. v. d. Broeke; (II.) W. S. v. Leeuwen and M. v. d. Made (*Arch. exp. Path. Pharm.*, 1920, **88,** 304-17, 318-32).—(I.) In the serum there are materials which strengthen the effect of pilocarpine on the surviving intestine. Cholesterol and " cerebron " have the same effect. Lecithin is doubtful, and " peptone " is very efficacious; the dialysate from Witte's peptone gave negative results. Very small amounts of Witte's peptone inhibit pilocarpine action, and thus, like rabbit's serum, forms a " compound " with it. Cholesterol, cerebron, and lecithin, do not possess this property. (II.) Adrenaline action on blood-pressure is influenced by substances in the blood which increase its activity. This is not very evident in some cats, but their response to adrenaline is increased by injecting serum

(human or cat's), or Witte's peptone or its dialysate. Rabbits have blood so rich in the furthering material that peptone injection does not improve the adrenaline response unless, as in rare cases (1 found), the rabbit is insensitive to adrenaline; the peptone made it sensitive.—W. D. H.

566. Cellular Immunity: Natural and Acquired Immunity to Cobra Venom. J. A. Gunn and R. St. A. Heathcote (*Proc. Roy. Soc.*, 1921, **92B,** 81-101).—Neither in natural nor in acquired immunity to cobra venom can the red corpuscles be taken as a reliable index of cellular immunity. This may be due to the fact that the structure and life-history of erythrocytes is different from other cells.—J. A. H.

567. Venins coagulants et anticoagulants. B. A. Houssay et A. Sordelli (*Arch. intern. physiol.*, 1920, **15,** 372-82).—1. Les venins de serpents produisent l'incoagulabilité *in vivo* par deux mécanismes: (*a*) Les venins coagulants *in vitro* produisent *in vivo* la précipitation progressive du fibrinogène et défibrinent le sang. (*b*) Les venins anticoagulants *in vitro* détruisent le cytozyme et par cela même empêchent la formation de la thrombine sanguine.

2. Les venins coagulants produisent l'accélération de la coagulation (phase positive) sitôt après leur injection veineuse. Cette accélération est due: (*a*) Dans presque tous les cas à l'action coagulante du venin qui s'ajoute à la coagulation normale. (*b*) Pour quelques venins (type Daboïa) il s'ajoute encore la propriété d'accélérer fortement la production de la thrombine sanguine.—L. F.

568. Die Bedeutung der Calcium- und Kaliumionen bei Giftwirkungen am Herzen. II. Arsen und Chinin. S. G. Zondek (*Arch. exp. Path. Pharm.*, 1920, **88,** 158-71).—Both arsenic and quinine, which have no chemical relationship, produce diastolic standstill of the frog's heart. The effect of both is intensified by K, and neutralised by Ca. As pointed out in a former paper, the similar effect of chloral hydrate is also (under some conditions) annulled by Ca.—W. D. H.

569. Über Vergiftung mit Fluorverbindungen. Kockel and Zimmermann (*Münch. med. Woch.*, 1920, **67,** 777-9).—A report on 2 cases of poisoning with hydrofluoric acid. Symptoms are rapid loss of strength and vomiting, leading to death in 2 hours. The findings post-mortem are not characteristic; they resemble those of arsenic poisoning, but differ in the occurrence of considerable hæmorrhage from the surface of the mucous membranes of the stomach and the duodenum, in this being similar to the effects of poisoning with soluble barium salts. Details of chemical examination are given.—J. H. B.

PATHOLOGY

570. Experimental Traumatic Shock. I. The Basal Metabolism. J. C. Aub. **II. The Oxygen Content of the Blood.** J. C. Aub and T. D. Cunningham. **III. Chemical Changes in the Blood.** J. C. Aub and H. Wu (*Amer. J. Physiol.*, 1920, **54,** 388-424).—Urethane is satisfactory for study of short periods of gaseous metabolism. Shock by crushing of thigh muscles reduces basal metabolism to 70% of its initial value. Fall of blood-pressure produced by increasing pericardial pressure has the same effect. The effect of hæmorrhage may be slight, but the amount of blood removed was not great. Recovery by transfusion of blood is associated with return of the metabolism to normal. The oxygen content of the venous blood is diminished even before the fall of blood-pressure to shock level. The blood-flow is greatly decreased during the development and for some time after recovery from shock. Anoxæmia is probably the cause of the decreased metabolism. When shock was produced by muscle trauma, there was a marked increase of creatine, urea, and sugar in the blood. The increase of creatine confirms the hypothesis of muscle necrosis as the cause of shock. The meaning of the rise of sugar is not clear, but several possibilities are suggested.—W. M. B.

571. Der Ursprung des Anaphylaktischen Shockes. J. Forrsman (*Biochem. Zeit.*, 1920, **110,** 133-63).—This is a most interesting paper. The author has studied a phenomenon which appears to be the same as, or at any rate analogous to, anaphylaxis, to which he gives the name of " contrary anaphylaxis " (umgekehrten anaphylaxie). This form of anaphylaxis is so called because it is produced in the opposite way to ordinary anaphylaxis—namely, by injecting serum rich in antibody instead of antigen. In the cases considered the serum was obtained by immunising rabbits to sheep's blood-cells. Such serum, when injected into guinea-pigs, produces all the symptoms of anaphylactic shock. The author sets out to investigate how this shock arises, carrying out 3 main lines of study: First, he injects the serum directly into various organs—liver, kidney, brain, etc.—and he finds that, so far from producing any increase of shock, the shock is often prevented entirely. Clearly, then, the organs themselves do not contribute to the production of shock, but rather certain substances capable of neutralising the toxic products, if such there be, which give rise to the phenomenon. Secondly, the author tries the effect of extirpation of various organs under anæsthesia, and subsequent injection of serum. He finds that the anaphylactic shock symptoms are still produced even when such organs as kidney and spleen are removed. It is necessary, of course, to know that the shock can be obtained in spite of previous anæsthesia, and also that the anæsthesia does not contribute to the shock; both of these considerations are fully dealt with. The results all point to the probability that no special organs are responsible for the symptoms, and the author is convinced that it is in the vascular endothelium that the toxic products causing the shock take their origin. Thirdly, therefore, he sets out to investigate what part of the general system is, or pulmonary system may be, the site of the production of such toxins. The author follows the idea that if any part of the vascular endothelium is especially sensitive in this respect, then local injection of serum at this area should produce a more profound state of shock than when the serum reaches it after suffering dilution in the general blood-stream by injection at a distance from such an area. He thus injects serum into various points of the circulatory system, and compares the degree of shock produced. He finds that injection into the venæ cavæ, or heart cavities, is most effective, and since injection into the left ventricle is as effective as injection into the right, it appears that the pulmonary vascular endothelium plays no especial part, and that it is essentially the coronary vascular endothelium which is highly sensitive to the injection of the serum. The other arterial branches springing immediately from the aorta must also be considered, and the author thinks the bronchial arterial endothelium of special importance. Summing up, then, the author has studied a phenomenon analogous to, if not the same as, anaphylactic shock, and concludes that the symptoms are due to toxins produced from some special area of the vascular endothelium through the action of the injected serum.—E. C. G.

572. Sur la nature du choc anaphylactique. A. Lumière and H. Couturier (*Compt. rend.*, 1921, **172,** 294-6).—Guinea-pigs sensitised to horse serum are protected from the fatal effects of a second injection by an injection of an emulsion of sulphate of barium 30 seconds before the otherwise fatal dose of horse serum is administered. The anaphylactoid shock caused by barium emulsion can, conversely, be prevented by vaccination with antigen. The authors infer that the mode of production of the shock caused by these substances is the same in either case. The duration of the immunity may be 24 hours, and it is apparently a " desensitisation " (see Abstract No. 3661, Vol. V., p. 578).—J. A. M.

573. Sur le choc provoqué par l'introduction de substances insolubles dans la circulation. A. Lumière and H. Couturier (*Compt. rend.*, 1920, **171,** 1172-4).—Injection of a suspension of barium sulphate, the particles of which are 2 to 4 μ in diameter, leads

to the production of a state indistinguishable from anaphylactic shock. The authors believe that this points to a physical rather than a chemico-toxic explanation of the phenomena of anaphylaxis.—J. A. M.

574. The Mechanism of Shock and Exhaustion. G. W. Crile (*J. Amer. Med. Assoc.*, 1921, **76,** 149-55).—Shock and exhaustion are primarily due to changes in the brain. —C. L. E.

575. Temperature Changes induced by Gum Acacia Injections in Normal and Fevered Animals. H. G. Barbour and L. H. Baretz (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 209-10).—In rabbits, acacia injections induce a mild temperature depression in health, but a definite antipyretic effect in fever. Acacia injections raise the temperature of normal dogs, but in fever dogs exert a brief, though definite, antipyretic action, accompanied by increased blood-volume.—D. H. de S.

576. An Attempt to Produce Hæmochromatosis Experimentally. L. R. Chandler (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 24-5).—The total removal of the large intestine in dogs apparently does not produce a recognisable degree of hæmochromatosis within a period of $3\frac{1}{2}$ months.—D. H. de S.

577. Dosage des produits de dégradation des matières protéiques dans le sérum sanguin. A. Bach and Sbarsky (*Compt. rend.*, 1920, **171,** 1175-7).—A method is described for the estimation of the amount of "degradation products of protein" in serum. Horses injected with the toxins of diphtheria, dysentery, and scarlet fever respectively, show an increase of such degradation products in their serum for a short time after the injection of the toxin.—J. A. M.

578. Suprarenal Toxic Serum and Atheroma. F. Marabotto (*Ann. d. istitut. Maragliano*, August, 1916, **8**).—The author confirmed the statement that adrenaline is a cause of atheroma experimentally in animals. By immunising rabbits with repeated small doses of adrenal emulsion their serum acquired lytic properties towards adrenal tissue, and this serum was found to be protective against the action of adrenaline in causing atheroma. The *Lancet*, in an annotation (1921, i., p. 292) on this subject, speaks of Marabotto's work as recent, and hopes scientific treatment of the serious disease atheroma may soon be possible. But during the last 5 years one has heard of no practical outcome of the work. Perhaps it is too early to expect it.—W. D. H.

579. Beziehungen zwischen Blut und Organen. K. Kottmann (*Schweizer mediz. Woch.*, 1920, 1060-4).—Experiments on the relations between blood and organs by colloid chemical investigations on serum. Serum in pregnancy has an increased capacity to mobilise iron loosely held in adsorption combination. The author has previously described a pregnancy reaction based on this fact. The specific colloids of the thyroid in Basedow's and Kropf's diseases are also differently distributed in serum; in the former the cells liberate too little, and in the latter too much of the iodine complex. The known disturbances of function are thus explainable. The degree of dispersion of the blood-colloids in the capillary region of a carcinoma is much greater than in the capillaries of non-cancerous organs.—H. W. (transl. C. L. E.).

580. Retikulo-endothelialer Zellapparat und Blutgerinnung. R. Stephan (*Münch. med. Woch.*, 1920, **67,** 309).—Two cases of purpura fulminans were cured by illumination of the spleen with X rays. Examination of normal individuals showed that illumination of the spleen caused a temporary decrease in the coagulation time of blood *in vitro*. There was a prolonged increase in the amount of ferments in the blood, which persisted after the coagulation time had again become normal. These changes are brought about by a stimulation of the reticular endothelial cells of the spleen described by Aschoff and Landaus.—J. H. B.

581. The Treatment of Pernicious Anæmia by Splenectomy. H. Z. Giffin and T. L. Szlapka (*J. Amer. Med. Assoc.*, 1921, **76,** 290-5).—In addition to the immediate remis-

sion constantly following splenectomy, life was prolonged in 20% of cases, and the operation may be recommended when "the possibility of the prolongation of life appeals to the family and to the patient."—C. L. E.

582. Uræmia. N. B. Foster (*J. Amer. Med. Assoc.*, 1921, **76,** 281-4).—A lecture giving a general review of the state of knowledge of the condition. The author outlines some experiments which indicate the presence in the blood of patients suffering from convulsive uræmia of a dialysable basic toxin, a fraction of a milligram of which kills guinea-pigs with convulsive symptoms.—C. L. E.

583. Meat Diet in Sprue. P. Conran (*Brit. Med. J.*, 1920, **2,** August 7, reprint, 6 pp.).—The diet was beneficial in 2 cases.—J. A. H.

584. A New Type of Human Enterolith. H. S. Raper (*J. of Path. and Bact.*, 1921, **24,** 119).—The enterolith, found about the middle of the jejunum, consisted of choleic acid, 72·5; fatty acids, fat, and cholesterol, 16; and of insoluble food débris, 16%.—W. E. G.

585. Experimentelle Beiträge zur Pathenogenese der Gicht. Gudzent (*Zeitsch. f. klin. Med.*, 1920, **90,** 147-70).—The content of the urates in the blood is of no importance for the diagnosis of gout, for the increase is observed in many other diseases, and many cases of gout show lower values than normal. If injections of urates are made, these urates are excreted up to 100% in healthy men. On the contrary, the tissues of gout cases show retention of the urates up to 90%. A smaller retention of the urate injections was also observed in other diseases (tabes, tuberculosis, glomerulo-nephritis), but the concentration of the urates was in these cases the same in the blood as in the tissues, while in cases of gout the concentration of the urates is very much higher in the tissues than in the blood.—H. W.

586. Über die Bedeutung des Lösungsmittel für die Ausscheidung intravenös injizierten Harnsäure beim Nichtgichtiker. M. Bürger (*Arch. exp. Path. Pharm.*, 1920, **87,** 392-405).—Previous observers have stated that in gout much uric acid (if injected intravenously) is retained, but in health it is all excreted. This last statement requires amendment. In non-gouty persons it is only partly excreted at any rate during the 48 hours that follow the injection. The injection of 0·5 grm. dissolved in dilute NaOH was performed in 12 people; the amount excreted in the next 48 hours' urine varied, but averaged 27%. If the uric acid, however, was dissolved in piperazine solution this figure rose to 52%. Much of the paper is devoted to a discussion of what happens to the remainder.—W. D. H.

587. Ein neues Krankheitsbild nach Seruminjektionen. J. Forrsman (*Biochem. Zeit.*, 1920, **110,** 164-75).—By injecting rabbit's serum previously made hæmolytic to sheep's corpuscles into the carotid artery of guinea-pigs the author produces a complex of symptoms of which the disturbance of balance, strabismus, sometimes exophthalmos, are most marked, but not anaphylactic shock. The effect is produced and death occurs with much smaller doses than when the serum is injected intravenously, and, moreover, the effect is much more marked when the injected stream is directed towards the heart in the carotid artery; this, the author considers, means that more of the serum reaches the cerebellum via the vertebral arteries.—E. C. G.

588. Au sujet de la production des anticorps. J. Maisin (*Réunion soc. belge biologie*, 4 décembre, 1920, 1575-6).—Des recherches relatives aux agglutinines et aux hémolysines chez le lapin, établissent qu'il se fait une production d'anticorps plus intense chez les animaux qui subissent des inoculations répétées que chez ceux qui ne subissent qu'une injection, même si les premiers ne reçoivent en tout qu'une fraction de la dose inoculée en une séance.—L. F.

589. Disparition par vieillessement de la réaction de Bordet-Wassermann dans certains sérums syphilitiques. E. Renoux (*Réunion soc. belge biologie*, 9 octobre, 1920, 1298-9).—Des sérums syphilitiques chauffés à 56° pour la pratique de la réaction de

B.-W. et donnant une réaction positive, peuvent, si on les conserve 2 ou 3 jours à la température de la chambre, donner une réaction B.-W. négative. Ils retrouvent pourtant leur pouvoir fixateur intact si on les chauffe une 2me fois 10 minutes à 56°. Importance pratique de ce fait.—L. F.

590. Entrainement du principe actif de la réaction de Bordet-Wassermann par les globulines précipitées. E. Renoux (*Réunion soc. belge biologie*, 9 octobre, 1920, 1299-1302).—Si, dans un sérum syphilitique dilué d'eau distillée, on sépare globuline et sérine par barbotage d'anhydride carbonique, l'élément actif de la réaction passe très irrégulièrement dans la globuline. Il y passe entièrement si on ajoute des lipoïdes (Antigène Bordet-Ruelens) au sérum dilué avant le barbotage. Ce fait se vérifie également dans les sérums syphilitiques ayant perdu leur pouvoir fixateur par vieillissement. Pour y être mis en évidence, il demande un chauffage de la globuline séparée à 56° pendant 10 minutes.—L. F.

591. L'immunité et l'anaphylaxie sont deux états biologiques distincts. 1er et 2d mémoire. M. Arthus (*Arch. intern. physiol.*, 1920, **15,** 383-93 et 394-411).—(1) Expériences démontrant que pour les venins de serpents curarisants, toute immunité acquise n'est pas précédée d'une phase d'anaphylaxie, en ce qui concerne leur propriété curarisante. (2) A la question: *l'immunité acquise du lapin est elle non spécifique, comme est non spécifique son anaphylaxie?* les expériences de l'auteur répondent: *non, l'immunité acquise du lapin est spécifique pour les venins curarisants et pour les venins protéotoxiques.* Ces conclusions ne s'accordent pas avec la conception de Nolf, suivant laquelle l'anaphylaxie et l'immunité sont deux manifestations d'un même état biologique. En réalité l'anaphylaxie et l'immunité sont des manifestations de deux états biologiques distincts.—L. F.

592. (1) Exsudats leucocytaires et autolyse microbienne transmissible. (2) Le bactériophage de d'Hérelle, sa production et son interprétation. J. Bordet et M. Ciuca (*Réunion soc. belge biologie*, 9 octobre, 1920, 1293-5 et 1296-8).—Sous l'action d'un exsudat leucocytaire, provenant d'un animal, vacciné contre une souche déterminée de *B. coli*, les microbes de cette souche sont susceptibles d'acquérir une aptitude prononcée à l'autolyse. En outre ils laissent diffuser dans le milieu où ils poussent, un principe lysant autorenouvelable et transmissible en série dans de nouvelles émulsions de coli normal de même origine que celui dont on s'est servi pour la vaccination de l'animal. Le principe lysant transmissible, signalé par d'Hérelle est attribué par lui à un virus vivant bactériophage, par Kabeskima à une prodiastase microbienne, déclanchée par un catalyseur d'origine intestinale. D'après B. et C. le principe actif serait d'origine leucocytaire et en rapport avec les phénomènes de défense de l'organisme. Les microbes, qui résistent à l'autolyse, poussent à peine dans le bouillon, tout en lui conférant le pouvoir lytique transmissible. Après quelques repiquages sur gélose, les microbes donnent une culture luxuriante, glaireuse, qui par son aspect diffère beaucoup de celle du coli normal originel; repiqués en bouillon, ils lui confèrent le même pouvoir lytique transmissible. Moins phagocytables que le coli normal, ces microbes sont plus virulents pour le cobaye; après passage dans le sang d'un cobaye, ils gardent leurs propriétés de culture ainsi que leur pouvoir lysogène transmissible. Un c.c. de culture lysée de coli normal, introduit dans le péritoine d'un cobaye 15 minutes après une dose mortelle de coli normal, prévient chez l'animal les accidents mortels.—L. F.

593. Antibodies—III. F. M. Huntoon, P. Masucci, and Edith Hannum (*J. Amer. Chem. Soc.*, 1920, **42,** 2654-61).—The protective antibodies in antipneumococcus serum were isolated by adding the antigen, allowing the antibody and antigen to unite, centrifuging, treating the sediment with reagents to separate the antibodies again, and filtering through a candle filter. The clear, limpid solution of the antibodies was tested in various ways, and from the results it may be gathered that they are colloidal,

since they do not dialyse; not influenced by trypsin; not globulins; not soluble in ether; not precipitated by 30% salt solution; not injured by dilute acids or alkalis; and not affected by heat below 60°.—W. D. H. (*J. C. Soc.*).

594. Der gegenwartige Stand unserer Kenntnisse der Fettantikörper. H. Schmidt (*Münch. med. Woch.*, 1921, **68**, 69-71).—A summary of the evidence of the production of antibodies to fat and lipoid antigens.—J. H. B.

595. Bacterien und Blutfarbstoff. H. Kammerer (*Arch. exp. Path. Pharm.*, 1920, **88**, 247-86).—The effects of various bacteria on hæmoglobin are set out. Not only is hæmolysis produced, but streptococci and pneumococci cause methæmoglobin formation; hæmatin was not produced. In agar cultures with blood, colourless areas occur, the chief cause of which is hæmolysis and diffusion of the pigment into the neighbourhood. Mesohæmatin and metallic salts of mesoporphyrin kill bacteria, or inhibit their action in varying degree. Sensibilisation by light plays no part in this. Paramœcia are rendered quiescent by mesohæmatin and hæmatoporphyrin, but not by hæmatin and bilirubin solutions. Mesohæmatin does not affect phagocytosis in warm-blooded leucocytes either *in vivo* or *in vitro*. Hæmatin in dilute alkali inhibits *B. anthracis* and *megatherium*, but hæmatoporphyrin, bilirubin, etc., do not. The above are examples of the numerous data given *in extenso*.—W. D. H.

596. The Effect of Blood-Pigment upon the Growth of B. influenzæ. P. Fildes (*Brit. J. Exper. Pathol.*, 1921, **2**, 16-25).—Growth of *B. influenzæ* has not been observed to occur in the absence of blood-pigment. The quantity of blood-pigment necessary is small. Probably oxyhæmoglobin and carboxyhæmoglobin are incapable of allowing growth, the feeble multiplication in these pigments being due to a spontaneous change to methæmoglobin. Hæmatoporphyrin also fails to permit growth, but hæmatin allows a copious growth. *B. influenzæ* grows fairly well under anaerobic conditions, but rapidly dies out. The necessary oxygen is obtained from an oxygen store in the medium. This store is not dissolved active oxygen, but is inactive in a state of loose combination with a constituent of the medium. Under aerobic conditions the combined oxygen is used up by the bacillus and immediately reformed from the atmosphere. The combined oxygen in the medium is activated for the bacillus by the catalytic action of iron in the pigment. The feebleness of the growth on unchanged blood compared with that upon changed blood is due to a deviation of the oxygen, activated by the iron of the pigment, from the bacillus through the oxygen affinity of the unchanged pigment.—W. D. H.

597. Studies in Salt Action. III. The Effect of Hydrogen-Ion Concentration upon Salt Action. I. S. Falk (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 210-1).—The effect of electrolytes upon the viability of bacteria is influenced by variations in H-ion concentration. There appears to be a range of H-ion concentrations above and below which there is a much more rapid death-rate amongst the bacteria. Moreover, a bacterial suspension in a solution of NaCl, with or without $CaCl_2$, reverts to a certain H-ion concentration, whether its initial H-ion concentration was above or below this. —D. H. de S.

598. Intestinal Implantation of Bacillus acidophilus. H. A. Cheplin and L. F. Rettger (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17**, 192-5).—There may be a definite correlation between the rate of absorption in the alimentary canal of a utilisable carbohydrate and its tendency to effect a transformation of the intestinal flora. No definite relation was established between the H-ion concentration of the fæces and the bacterial flora.—D. H. de S.

599. Intestinal Implantation of Bacillus acidophilus. H. A. Cheplin and L. F. Rettger (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18**, 30-2).—The results confirm those previously obtained (see preceding Abstract). Attention is being given to the

preparation of *B. acidophilus* milk uniform from day to day in its physical and chemical properties.—D. H. de S.

600. An Unrecognised Pathway for Bacterial Invasion of the Respiratory Tract. M. C. Winternitz, G. H. Smith, and E. S. Robinson (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 195-6).—The pathway is by a lymphatic system in the submucous tissue of the trachea extending along the bronchi to the lungs.—D. H. de S.

601. Über unspezifische Leistungsteigerung. W. Weichardt (*Münch. med. Woch.*, 1921, **68,** 39-41).—The brains, bones, and intestines of a guinea-pig were extracted with boiling alcohol. The extract increased the growth of streptococci, particularly when the organs were previously treated with lactic acid.—J. H. B.

602. Anaphylaxis. H. G. Wells (*Physiol. Reviews*, 1921, **1,** 44-83).—A review.—W. D. H.

603. Studier öfver blodfermenten vid graviditet, karcinom och lungtuberkulos. J. Grönberg (*Finska. Läk. Handlingar.*, 1920, **62,** 599-631).—The Abderhalden reaction gave only positive results for 28 cases of pregnancy, 23 of carcinoma, and 34 of pulmonary tuberculosis when proper precautions were taken.—C. L. E.

604. Peptone Injections in Septicæmia. A. E. Gow (*Quart. J. Med.*, 1921, **14,** 187-204).—Witte's peptone in therapeutic doses causes rapidity of pulse, fall of blood-pressure, leucopenia, and increased coagulability of blood, all of short duration. If the patient has leucocytosis the effects are greater. A transient leucocytosis may follow the leucopenia. The changes are like those following intravenous injection of coli-typhoid vaccine, but peptone is less stimulating than bone-marrow. No proteose was found in the urine.—W. D. H.

605. The Blood-Alkali Reserve with Experimental Infections. E. F. Hirsch (*J. Amer. Med. Assoc.*, 1920, **75,** 1204-5).—Within 4 hours there is in rabbits a fall of alkali reserve and marked leucopenia. Within 24 hours there is complete recovery or even over-compensation of both.—C. L. E.

606. The Alkali Reserve in Epidemic Influenza and Bronchopneumonia. D. S. Hachen and R. Isaacs (*J. Amer. Med. Assoc.*, 1920, **75,** 1624-6).—There is a depletion of alkali reserve, very little influenced by giving alkali by the mouth. Prognosis was bad with alkali reserves lower than 46, and good when it was over 53. There was no regular relation between alkali reserve and complications, or cyanosis.—C. L. E.

607. The Alkali Reserve in Abdominal Infection. A. M. Willis (*J. Amer. Med. Assoc.*, 1921, **76,** 303-5).—The fall in alkali reserve is often insignificant.—C. L. E.

608. Wound Infections. S. R. Douglas, A. Fleming, and L. Colebrook (*Med. Res. Council*, 1920, Special Report Series, No. 57, pp. 159).—This is a defence of the Wright method of wound treatment, so much in evidence during the Great War. Cup-shaped wounds served as test objects, and the application of various antiseptics was found to have but little bactericidal effect, and their effective strength was rapidly dissipated by contact with the tissues. Even their physiological reaction of provoking a flow of lymph is regarded as immaterial, since the exudation is low in antitryptic power. A hypertonic salt solution has none of these disadvantages.—W. D. H.

PLANT PHYSIOLOGY

GENERAL

609. An Investigation in Transplanting. J. C. Whitten (Missouri Agric. Expt. Sta., *Res. Bull.*, **33,** 1919, 1-73).—Gives detailed records of the results of investigations upon transplanting carried out at the Missouri Agric. Expt. Station. The literature on the subject of transplanting is exhaustively reviewed.—C. W.

610. The Physiological Anatomy of the Plants of the Indian Desert. T. S. Sabnis (*J. Indian Botany*, 1920, **1**, 277-95).—Deals with Lythraceæ, Onagraceæ, Cucurbitaceæ, Ficoideæ, and Rubiaceæ.—C. W.

611. Elongation des végétaux par croissance ou par turgescence. A. D. Waller (*Compt. rend. soc. biol.*, 1920, **83**, 1085-6).—During an observation with the crescograph of Bose it is not possible to decide whether it is an irreversible growth process or a reversible change due to turgescence that is observed.—W. S.

612. Sur les relations entre le chondriome des champignons et la métachromatine. A. Guilliermond (*Compt. rend. soc. biol.*, 1920, **83**, 855-8). **A propos de la métachromatine** (*ibid.*, 859-61).—References given for those interested.—W. S.

613. Philippine Palms and Palm Products. W. H. Brown and E. D. Merrill (Dept. Agric. and Nat. Resources, Bureau of Forestry, P.I., *Bull.* **18**, 1919, 129 pp.).—The spp. and their economic products are described. The descriptions contain matter of physiological as well as of general interest.—W. S.

614. Philippine Fibre Plants. W. H. Brown (Dept. Agric. and Nat. Resources, Bureau of Forestry, P.I., *Bull.* **19**, 1919, 115 pp.).—Descriptions of the Philippine plants yielding fibre.—W. S.

615. New Fields of Phytochemical Research opened up by the Cultivation of Medicinal Plants on an Economic Scale. E. Kremers (*J. Indust. and Eng. Chem.*, 1920, **12**, 1018-20).—Digitalis, hyoscyamus, and peppermint are separately dealt with, and problems of production and extraction are considered. These include soil influences, curing, milling, and distillation.—R. C. K.

CHEMICAL

616. Auxographic Measurements of Swelling of Biocolloids and of Plants. D. T. MacDougal (*Bot. Gaz.*, 1920, **70**, 126-36).—A magnifying lever apparatus is figured which the author has used for recording the swelling by imbibition in his studies of colloids. The greater resemblance of the phenomena of swelling of plant structures to the imbibition of agar and pentosan colloids rather than to the imbibition of gelatin is stressed. The swelling properties of mixtures of agar and proteins are studied, and other approximations to the living cell. There are striking differences in the behaviour of the various types and mixtures of colloids to a range of P_H from 11·99 to 2·01. In either extreme of acidity or alkalinity gelatin swells about 3 times as much as in a mean value, while the plant colloids show no such marked differences. Opuntia mucilage swells more in water than in either acid or alkali; this is related to the biological part it plays in succulent plants.—F. F. B.

617. Method of Teaching Diffusion and Osmosis in Connection with Biological Work. P. Weatherwax (*Proc. Indiana Acad. Sci.*, 1918, 88-92).—An attempt to give clear, concise definitions of the terms met with in a study of the problems of osmosis and diffusion.—C. W.

618. A New Technical Method for the Estimation of the Saccharogenic Power of Diastatic Preparations. K. Oshima (*J. Indust. and Eng. Chem.*, 1920, **12**, 991-3).—Essentially a "Fehling" method with a fresh series of arbitrary details. The procedure is said to be very convenient for routine work on various diastatic products.—R. C. K.

619. The Proximate Analysis of Hardwoods; Studies on Quercus agrifolia. W. H. Dore (*J. Indust. and Eng. Chem.*, 1920, **12**, 984-7).—A consideration of the modifications required in the analytical methods used for coniferous woods when applied to hardwoods.—R. C. K.

620. A Chemical Method for the Detection in Fruit of a Prior Frozen Condition. W. M. Dehn and M. C. Taylor (*J. Indust. and Eng. Chem.*, 1920, **12**, 977-9).—Freezing

of fruit was found to promote excessive inversion of sucrose, and the products of inversion were found to decompose to a slight extent.—R. C. K.

621. Über das Vorkommen von Gipskrystallen bei den Tamaricaceæ. H. Brunswik (*Anz. Akad. Wiss. in Wien., mat.-nat. Kl.*, 1920, **56,** 92-3).—The presence of crystals of $CaSO_4$ has been observed in all spp. of *Tamarix*, *Reaumuria*, *Myricaria*, and *Hololachne*; they were absent from *Fouquiera*, in which calcium oxalate crystals are present. This supports the separation of the last-named genus into a separate family. Calcium oxalate crystals are also found in the *Frankeniaceæ*.—W. S. (*Ber. ü. d. ges. Physiol.*).

622. The Action of Sea-Water on Cotton and other Textile Fibres. C. Dorée (*Biochem. J.*, 1920, **14,** 709-14).—Cotton and silk fibres are destroyed by immersion in sea-water for 3 weeks; wool is somewhat more resistant. In the case of cellulose the destruction is due to the action of micro-organisms. Cellulose acetate silk can withstand the destructive action of the micro-organisms with sea-water for many months.—W. S.

623. Sulle sostanze tanniche del "Morus alba." C. Ghirlanda (*Atti R. Accad. Lincei, Rendiconti*, 1920 (5), **29** (ii.), 146-8).—Determinations were made of the tannin content of the leaves of the mulberry in the morning and afternoon, and of the cortex and wood of stem and root.—W. S.

624. Differentiation of the Extract of Yellow Wood (Morin) and the Extract of Quercitron (Quercitrin). E. Justin-Mueller (*Bull. Soc. chim.*, 1920, [iv.], **27,** 844-6).—The extract of these two woods may readily be distinguished from one another by dissolving a trace of extract in sulphuric acid (D 1·817), and then diluting with water. Under these conditions, the extract of yellow wood remains bright orange yellow, whilst the extract of quercitron is decolorised. Under the microscope the extract of quercitron appears in more or less agglomerated granules, whilst that of yellow wood shows sharply defined crystals.—W. S. (*J. C. Soc.*).

625. Colloidal Condition of the Proteins in Yeast Extracts. I. Yeast Extract Proteins in Alkaline Solution. Relationship to Biological Processes. A. Fodor (*Kolloid Zeitsch.*, 1920, **27,** 58-69).—Yeast extract contains an albuminous substance, termed "acid coagulum," which is connected with the ferment action of yeast extract; it differs mainly from the other proteins in yeast extract in solubility. On account of the difficulty in obtaining this substance in any quantity, its ferment action and properties have been determined in the original extract. The electrical conductivity, viscosity, and H-ion concentration have been determined at 25°. The H-ion changes in concentration with time; this is attributed to an increased combination with alkali.—W. S. (*J. C. Soc.*).

626. Colloidal Chemistry of Wood, its Constituents and their Formation. H. Wislicenus (*Kolloid Zeitsch.*, 1920, **27,** 209-23).—Theoretical. The constitution of wood and the method of its formation are discussed from the point of view of colloidal chemistry.—W. S. (*J. C. Soc.*).

ENZYME ACTION

627. La zymase et la fermentation alcoolique. J. Giaja (*J. de physiol. et de pathol. gén.*, 1920, **18,** 1094-1114).—Yeast treated with toluene has only one-fifth of the activity of living yeast. The latter put into sucrose solution does not reach its maximum activity until about half an hour later. Similarly, when toluene is added, somewhat less than half an hour is required to attain the constant low value. If yeast in the form of paste is treated with toluene the activity in sugar solution does not show the preliminary decrease in activity. The power of inversion is not affected by toluene to any notable degree. Living yeast treated by the cellulose-digesting enzyme of *Helix* also loses the greater part of its fermenting power by the action of toluene. The author holds that only a small part of the activity of living yeast is due to zymase, and that

the effect of toluene is not to be explained by the unmasking of the destructive action of endotrypsin.—W. M. B.

628. Effect of Salts upon Oxidase Activity of Apple Bark. D. H. Rose, H. R. Craybill, and R. C. Rose (*Bot. Gaz.*, 1920, **69,** 218-36).—The effect of each salt has been determined by differences in oxygen absorption in Bunzell's apparatus, when precipitated oxidase from the bark acts upon pyrogallol. Comparing all the salt actions (in 0·1 N solutions), the anions are found to be more significant than the cations; changes of H or OH, of course, play the first part. All sulphates augment, but all chlorides depress, the oxidation. This latter effect has a technical bearing on the preservation of fruit and vegetables without discoloration. Carbonates and salts of organic acids increase oxidation.—F. F. B.

629. Studies in the Mechanism of Enzyme Action. I. Rôle of the Reaction of the Medium in Fixing the Optimum Temperature of a Ferment. A. Compton (*Proc. Roy. Soc.*, 1921, **92B,** 1-6).—It is demonstrated that change in concentration of enzyme (takadiastase) does not alter the optimum temperature, which has already been lowered by increase of H-ion concentration.—G. E. B.

630. Untersuchungen über den Ablauf der alkoholischer Gärung der Hefe—II. E. Köhler (*Biochem. Zeit.*, 1920, **110,** 128-32).—The production of CO_2 from sucrose solution by the action of yeast is not regular, but represented by a fluctuating curve. The author proposes to call this the zigzag phenomenon.—E. C. G.

631. Die dritte Vergärungsform des Zuckers als allgemeine Folge der Dismutationswirkung anorganischer und organischer Alkalisatoren. C. Neuberg and W. Ursum (*Biochem. Zeit.*, 1920, **110,** 193-215).—In the history of alcoholic fermentation which this paper reviews two names stand out—Guy Lussac and Carl Neuberg. The former described one, the latter two, methods of fermentation. A hundred years intervene between the epochs. Alkalis cause the fermentation to pass along the third channel. This might be summed up by saying hydroxylion accelerates the Cannizaso reaction. The author calls it the process of dismutation.—E. C. G.

632. Zur Theorie der Invertasewirkung. L. Michaelis and M. Rothstein (*Biochem. Zeit.*, 1920, **110,** 217-33).—Invertase combines with 1 molecule of saccharose to form a compound with a dissociation constant of $3{\cdot}10^{-7}$. (As far as the abstractor can understand this is equivalent to saying that an unknown quantity of invertase combines with 1 molecule of saccharose !) The compound is acid, and dissociates as a truly soluble acid; the undissociated molecules decompose into the products of the enzymatic change. This the author considers explains what happens when P_H is about 3·5 or more. To explain what happens with $P_H < 3{\cdot}5$ is another matter.—E. C. G.

633. Änderung der Inversionsfähigkeit einer Oberhefe durch Vorbehandlung. S. Lövgren (*Fermentforsch.*, 1920, **3,** 221-40).—Previous treatment with ammonium acetate and cane-sugar for different lengths of time brought about a significant increase in the fermenting power of top yeast, but no increase resulted from addition of chlorides and sulphates of Mg, Ca, K, and Na. Addition of sucrose alone produced no increase in the inversion power after the first 24 hours, but after fermentation of the added sugar the inversion power rose quickly to a maximum and slowly sank after some days. The increase was 46% in a top yeast, 230% in a bottom yeast, of the original inversion power. Yeast water, added as N-containing nutrient, favoured the increase. Previous treatment with acetone, alcohol, and urea did not increase the activity of the races of yeast used.—W. S. (*Ber. ü. d. ges. Physiol.*).

634. Über Fermentwirkung. VII. Der Einfluss von Zusätzen (Toluol, Chloroform, Thymol und ferner von Neutralsalzen) auf den fermentativen Abbau von Dipeptiden durch Hefeauszug. E. Abderhalden and A. Fodor (*Fermentforsch.*, 1921, **4,** 191-208).—Addition of toluol, chloroform, and thymol causes no change of the activity of the

ferment, because these substances have no influence on the colloidal state. The influence of neutral salts depends on the colloidal state of the ferment. Addition of 0·66 equivalent neutral salts per litre effects, first a little furtherance, but soon after an inhibition of the ferment action. KI and K thiocyanate inhibit, even in the above-mentioned concentrations, and KCl, KBr, KNO_3, K_2SO_4 show, in somewhat higher concentrations, considerable inhibition. The degree of the optimal H-ion concentration is displaced, in the presence of neutral salts, to the acid side.—H. W.

635. Fermentwirkung. VIII. Darstellung von Fermentsolen aus Hefephosphorproteid. Die Activität des Sols als Function des Kolloidzustandes. A. Fodor (*Fermentforsch.*, 1921, **4**, 209-29).—Yeast phosphoproteins can be prepared from yeast extracts by dilute acids; they yield sols of varying stability according to the H-ion content of the solution. These sols show fermentative actions on polypeptides. This effect is parallel to the degree of dispersity, as observed by the ultramicroscope. It decreases with increase of the acid used. By alkali alone or alkaline reacting Na phosphates, the degree of dispersity and of activity is higher; but above a certain concentration considerable hydration takes place, and the ultravisible particles disappear. Addition of neutral salts (KCl) causes activity in small quantities with higher concentrations of acid. Inactive phosphoprotein (obtained by acids, alcohol) of yeast can be again made active (with the reappearance of increased dispersity) by alkali, together with KCl.—H. W.

636. Action of Sucrase on Substances resembling Inulin. H. Colin (*Bull. soc. chim. biol.*, 1920, **2**, 157-9).—Pseudo-inulin, inulinin, helianthinin are resistant to the action of sucrase, but synanthrine is hydrolysed.—J. C. D.

637. Obtention biochimique du sucre de canne à partir du gentianose. E. Bourquelot and M. Bridel (*Bull. soc. chim. Biol.*, 1920, **2**, 160-5).—The hydrolysis of gentianose by gentiobiase is very slow, and yields glucose and *a*-saccharose.—J. C. D.

PERMEABILITY

638. Temperature and Rate of Moisture Intake in Seeds. C. A. Shull (*Bot. Gaz.*, 1920, **69**, 361-90).—Data are provided of the rate at which seeds of xanthium (with a semipermeable testa) and split peas (freed of their testa) absorb water at the temperatures of 5°, 20°, and 35° C. The curve of per cent. gain of water against time is evidently not a simple curve. A logarithmic equation with 3 constants is the simplest expression possible for it, and some curves need several such equations. The main conclusion is that water absorption by seeds is a complex phenomenon, the initial, middle, and final phases being dominated by different physico-chemical processes. The author criticises the data published by A. Brown and Worley in 1912 for barley as being inadequate to bring out the compound nature of the curve. He shows that fuller data oppose their view that the rate is an exponential function of the temperature, and finds it rather an inverse function of the water already absorbed. Shull's values for Q_{10} are 1·5 to 1·8, while Brown and Worley found 2·02. He opposes the view that simplification of the water molecule with rising temperature is the only important factor in the different rates of absorption.—F. F. B.

GERMINATION AND DORMANCY

639. The Dormant Period of Timothy Seed after Harvesting. M. L. Fisher (*Proc. Indiana Acad. Sc.*, 1918, 276-9).—Immediately after harvesting only a very small percentage of germination may be expected from Timothy seed. In 25 days after harvesting a percentage of germination of 88% was obtained. Alternate drying and wetting increases the percentage of germination.—C. W.

VEGETATIVE DEVELOPMENT

640. A Quantitative Analysis of Plant Growth—II. G. E. Briggs, F. Kidd, and C. West (*Ann. Appl. Biol.*, 1920, **7,** 202-23).—A continuation of the author's analysis of the results of the growth experiments carried out with maize by Kreusler and his co-workers. The rate of growth is expressed per unit leaf area. The term "unit leaf rate" is used for the weekly rate of increase of dry weight in mgs. per sq. cm. The unit leaf rate, instead of undergoing a perfectly definite type of variation, as does the relative growth rate, fluctuates about a mean value. Correlations between unit leaf rate and various environmental factors are determined, the general evidence being that the unit leaf rate is correlated more closely with temperature than with any of the other environmental factors.—C. W.

641. Note on Curvature of Cut Stems of Bryophyllum calycinum. P. F. Fyson and K. Venkataraman (*J. Indian Botany*, 1920, **1,** 337-43).—From the results of experiments carried out with the object of determining whether special root-forming and curvature-producing substances could be recognised as being formed in the leaves no evidence in support of Loeb's theory was obtained, but rather evidence which confirmed Klebs' observations on the effect of an excess of water on adventitious root formation. A further series of experiments on the effect of the growth of an axillary bud on the development of the marginal leaf notches failed to confirm Loeb's results.—C. W.

642. Physiology of the Apple. Distribution of Food Materials in the Tree at Different Periods of Vegetation. O. R. Butler, T. O. Smith, and B. E. Curry (New Hampshire College Agric. Expt. Sta., *Techn. Bull.*, **13,** 1917, 1-21).—In the apple the carbohydrates are stored in the form of starch and saccharose. The distribution of these reserves, as well as that of potassium, phosphorus, fats, and ash, in the various parts of the apple tree at different periods of vegetation is recorded in tabular form.—C. W.

643. Seasonal Changes in the Chemical Composition of Apple Spurs. H. D. Hooker (Univ. Missouri Agric. Expt. Sta., *Res. Bull.*, **40,** 1920, 1-51).—Samples of apple spurs with leaves, flowers, or fruit removed were collected at intervals during a year, and their chemical composition studied in relation to their physiological condition. Three types were investigated—viz., (1) spurs that blossomed and bore fruit; (2) spurs that did not blossom, but which developed fruit buds; and (3) barren spurs that neither blossomed nor developed fruit buds. Determinations were made of the dry weight, ash, titratable acidity, potassium, phosphorus, total nitrogen, reducing and non-reducing sugars, starch, total polysaccharides, and hydrogen-ion concentration. It was found that the seasonal changes in most of the constituents examined were distinct, and characteristic of the condition of the spur.—C. W.

GROWTH OF LOWER PLANTS

644. Weitere Beiträge zur Physiologie der Hefe. E. Köhler (*Biochem. Zeit.*, 1920, **111,** 17-29).—Chiefly theoretical.—E. C. G.

645. Effect of Amino-Acids on the Growth of Tubercle Bacilli. P. Masucci (*J. Lab. and Clin. Med.*, 1920, **6,** 96-9).—Amino-acids, added to glycerol broth, hasten the growth of *B. tuberculosis* by furnishing the necessary form of nitrogenous matter for the building of the more complex bacterial protein.—D. H. de S.

646. The Length of Time to Incubate Petri Plates. H. A. Noyes, E. Voigt, and J. D. Luckett (*Proc. Indiana Acad. Sc.*, 1918, 102-9).—The rapidity with which bacteria develop into colonies is shown to vary with the soil, and to be influenced by soil temperature, moisture, and aeration.—C. W.

647. Observations on the Volvocaceæ of Madras. M. O. P. Parthasarathy (*J Indian Botany*, 1920, **1**, 330-6).—Contains notes on the physiology of various members of the Volvocaceæ which occur in Madras.—C. W.

CROP YIELD

648. Noch einmal zum Gesetz des Minimums. A. Meyer (*Landw. Versuchs-Stat.*, 1919, **94**, 247-50).—The author points out that Mitscherlich's logarithmic formula is based on the results of experiments with a limited number of plants. The correct way, he says, is to investigate the maximum production per unit area of ground, not per plant, under various conditions.—G. E. B.

649. Das Gesetz des Pflanzenwachstums. E. A. Mitscherlich (*Landw. Jahrb.*, 1919, **53**, 167-82).—The author puts forward the equation $y = A(1 - e^{-cx})^n$; y is yield of plant at time x measured in arbitrary units, n the number of growth factors, A the maximum possible yield, c a constant, and e the base of the natural logarithms—as expressing the relation of yield to time. Experimental results are compared with results calculated from the equation, using suitable constants.—G. E. B.

650. Ein Beitrag zur Standraumweite unserer landwirtschaftlichen Kulturpflanzen in Gefässen und im freien Lande, bei Reinsaat und Mengsaat. E. A. Mitscherlich (*Landw. Jahrb.*, 1919, **53**, 342-60).—The author develops equations expressing the relation between yield per plant and yield per area respectively, and density of sowing. Comparisons of experimental and calculated results are given.—G. E. B.

651. Prinzipielle über legung zum Wachstumsgesetz. B. Baule (*Landw. Jahrb.*, 1919, **54**, 493-506).—A mathematical discussion of the effect of time and growth factors, including variations in intensity of the latter, on the yield of plants.—G. E. B.

652. The Relation of Nitrogen, Phosphorus, and Organic Matter to Corn Yield in Elkhart County, Indiana. R. H. Carr and L. Hoffmann (*Proc. Indiana Acad. Sc.*, 1918, 160-5).—It is shown that on average field conditions for every increase of 2,672 pounds of organic matter, 71·6 pounds of nitrogen, and 35·7 pounds of phosphorus per acre there is an increase of one bushel of corn.—C. W.

653. Untersuchungen über die Wirkung des Humussäuren Ammoniaks. O. Lemmermann and H. Wiessmann (*Fühling's Landw. Hg.*, 1920, **69**, 282-9).—Nitrogen manures have a different effect upon the relation of the yield of corn to that of straw on different soils.—C. W.

654. Ist das Abknicken der Zuckerrübenblätter ein Mittel zur Steigerung des Ertrages? O. Fallada and J. K. Greisenegger (*Öster.-ungar. Zeitsch. f. Zuckerind.*, 1920, **47**, 16-25).—The answer is in the negative.—W. S. (*Ber. ü. d. ges. Physiol.*).

655. Einfluss der Reihenorientierung auf die Zuckerrübenernten im Marchfelde. J. K. Greisenegger (*Öster.-ungar. Zeitsch. f. Zuckerind.*, 1920, **47**, 26-43).—The E.-W. direction appears to give the best yield, N.E.-S.W. is preferable to N.W.-S.E., while N.-S. is the worst direction.—W. S. (*Ber. ü. d. ges. Physiol.*).

ASSIMILATION

656. Studies of Photosynthesis in Marine Algæ. 1. Fixation of Carbon and Nitrogen from Inorganic Sources in Sea-Water. 2. Increase of Alkalinity of Sea-Water as a Measure of Photosynthesis. B. Moore, E. Whitley, and T. A. Webster (*Proc. Roy. Soc.*, 1921, 92_B, 51-60).—This is a record of experiments to show that a marine alga, *Enteromorpha compressus*, with the aid of sunlight, assimilates more nitrogen than is contained, as ammonia, nitrate, or nitrite, in the sea-water in which it is immersed. Hence, it is concluded that free nitrogen from the atmosphere is fixed.—G. E. B.

657. Kohlensäure-Düngung. E. Reinau (*Fühling's Landw. Hg.*, 1920, **69,** 178-84).—The author gives an account of the origin and growth of the use of carbon dioxide as a fertiliser.—C. W.

ROOT EXCRETION

658. Über Wurzelausscheidungen. J. K. Greisenegger and K. Vorbuchner (*Österr.-ungar. Zeitsch. f. Zuckerind. und Landw.*, 1920, **47,** 82-91).—The authors grew onion bulbs, from which roots began to appear after a day. The water into which the roots grew remained neutral to litmus, but Cl, SO_4, Fe^{111}, Mg, Na, Ca, K, P, NO_2, diffused into the water, as well as NH_3, CO_2, glucose, and mustard oil. These results support the opinion of Brocq-Rousseu and Grain as to the existence of osmotically active secretions from roots.—W. S. (*Ber. ü. d. ges. Physiol.*).

659. Beitrag zur Kenntniss der Oxydationsvermögens der Wurzeln der höheren Pflanzen. R. Borkowski (*Landw. Versuchs-Stat.*, 1919, **94,** 265-85).—Growing roots of higher plants possess power of oxidising iron in dilute solutions. The process is limited, on the root surface, to the root hairs and the region between root cap and growing-point; inside the root, to the walls of the vessels and adjoining parenchyma. In some plants the oxidising power increases with age, whilst in others the reverse condition holds. The relation of this process to the various soil processes is discussed.—G. E. B.

TRANSPIRATION

660. Studies in Evaporation and Transpiration. G. F. Freeman (*Bot. Gaz.*, 1920, **70,** 190-210).—Formulæ are constructed for working on these phenomena in a known current of air, based on rise of dew-point of outgoing air over ingoing. These formulæ take account of initial dew-point and temperature of incoming air, of rate of movement, and area of evaporating surface. It is demonstrated that they give excellent agreement with observed data when a wet physical surface is employed in a chamber through which a controlled volume of air passes. When a living branch is substituted for the evaporating surface the relations are purely physical in some cases, but with changes in dew-point of ingoing air alterations of transpiration, due to stomatal movement, are pronounced.—F. F. B.

RESPIRATION

661. Carbon Monoxide a Respiration Product of Hereocystis Luetkeana. S. C. Langdon and W. R. Gailey (*Bot. Gaz.*, 1920, **70,** 230-9).—The bladder floats of this large, brown, marine alga contain, besides nitrogen and 15 to 25% oxygen, always carbon monoxide, 1 to 12%, but no CO_2. This is a unique constituent of living tissues, and it is clearly demonstrated that it does not arise by autolysis or decay, and that it does not form when these large floats are isolated, filled with nitrogen, and kept alive in the sea. Only when oxygen is present initially is CO formed, so that it seems clear that its production is to be classed as a respiration process.—F. F. B.

IRRITABILITY AND MOVEMENT

662. Effect of Unilateral Monochromatic Light and Group Orientation on the Polarity of Germinating Fucus Spores. A. M. Hurd (*Bot. Gaz.*, 1920, **70,** 25-50).—When fertilised eggs of Fucus germinate in the dark the orientation of the first cell division, cutting off a rhizoid cell, is determined by the relation to adjacent eggs in the crowded culture. In a close group the rhizoids are all directed towards its centre. Pairs of adjacent eggs point their rhizoids at one another provided they are within 0·2 mm. Isolated eggs may produce a rhizoid in any direction. This group orientation is attributed to reduced oxygen content as the factor determining the direction of the rhizoid. Possibly

some chemical stimulus may determine it. When the cultures are illuminated unilaterally, the first division wall in the egg is at right angles to the incident light except where the cells are closely grouped, and so their orientation is determined chemically. The author has worked also with monochromatic light screens, getting the transmitted energy equal for each colour, using a thermopile. It is found that violet, blue, and green light produce the light orientation effect, but the red, orange, and yellow act as darkness. Careful physical measurements were made of the rays transmitted by the screens.—F. F. B.

663. Geo-Presentation and Geo-Reaction. E. O. Schley (*Bot. Gaz.*, 1920, **70,** 69-81).—Attempt is made to determine alteration of chemical composition of the tissues on the upper and under sides of geotropically stimulated shoots and roots by direct analysis of the cut-out tissues. The nitrogen content is unaltered, but a change of polysaccharides to hydrolysable sugar on the convex side is detected. A transient increase of osmotic pressure on this side is noted. The geotropically stimulated root respires more than a normal one in a Tashiro biometer, while for the shoot the respiration is greater on the convex side. The time sequence of chemical changes in a stimulated shoot is (1) increased respiration; (2) increased acidity; (3) increased turgor; and (4) increased hydrolysis polysaccharides on lower side.—F. F. B.

664. Statocytes of the Wheat Haulm. T. L. Prankerd (*Bot. Gaz.*, 1920, **70,** 148-52).—Study of the "nodes" of the grass haulm reveals the presence of tissue composed of cells containing a single mobile crystal of calcium oxalate. This may serve as a statolith for geo-perception in this organ, which is so sensitive to gravity when grass-haulms are laid horizontal. This is the only case of a crystal statolith recorded in plants. Its rate of fall when the tissue is inverted is 10 μ per minute, a much faster rate than that of falling starch-grain statoliths.—F. F. B.

665. Der heutige Stand der Statolithentheorie des Geotropismus. H. v. Guttenberg (*Naturwiss.*, 1920, **8,** 571-7).—Review. The recent work of Zollikofer, Fitting, Buder, and others is summarised.—W. S. (*Ber. ü. d. ges. Physiol.*).

666. Preliminary Note on a Hydrion Differentiation Theory of Heliotropism. J. Small (*New Phyt.*, 1920, **19,** 275-6).—W. S.

FLOWER AND FRUIT FORMATION

667. Ripening of Pears and Apples as Modified by Extreme Temperatures. E. L. Overholser and R. H. Taylor (*Bot. Gaz.*, 1920, **69,** 273-96).—When unripe apples are placed in store chambers at temperatures from 21° to 40° C. the rate of ripening is quicker the higher the temperature; pears, however, show a definite retardation in ripening at certain high temperatures. Taking the time for ripening of Bartlett pears at 21° C. as standard, there occurs a retardation of 5 days at 31° C., and of 13 days at 34·4° C. and at 40° C. Between these last two temperatures there lies a maximum of delay, and at still higher temperatures the fruits ripen quicker. Control experiments at different humidities for a given temperature were carried out, but this factor only affects wilting, and not rate of ripening. Pears ripened above 30° C. are more acid and less sweet. The authors suggest that these striking metabolic effects may be due to the higher temperatures approaching the maximum temperature at which the pear enzymes can function.—F. F. B.

668. The Process of Ripening in the Tomato, considered especially from the Commercial Standpoint. C. E. Sands (U.S. Dept. Agric., *Bull.* **859,** 1920, 1-38).—Maturity in the case of the tomato is dependent upon age, not upon size. Using fruit of known age, the author made analyses which indicated that in general throughout the ripening period there is an increase in moisture, acids, and sugars, whereas there is a decrease

in solids, total nitrogen, starch, pentosans, crude fibre, and ash. Sugars increased from 25·7% in fruit 14 days old to 48% in ripe fruit. In the same interval the starch content decreased from 15·8 to 2·7%. Data obtained seem to indicate that the combined results of picking fruit green, of wrapping, and of closing the cars in transit probably account for the total differences existing in quality between commercially shipped and vine-ripened tomatoes.—C. W.

669. Some Factors Favouring or Opposing Fruitfulness in Apples. C. C. Wiggans (Univ. Missouri Agric. Expt. Sta., *Res. Bull.*, **32,** 1918, 1-60).—A 5-year study of the behaviour of individual apple fruit spurs of 6 commercial varieties led to the following conclusions: The soil in which a tree is growing has little effect upon the performance of the individual spurs with respect to alternation (*i.e.*, the production of flowers only once in 2 years). The fruitful year of certain alternating varieties may be changed by a removal of the blossoms through either accident or design. Sap from bearing spurs has a slightly higher concentration (*i.e.* lower freezing-point) during a considerable portion of the year than sap from non-bearing spurs. A marked decrease in the sap concentration of both bearing and non-bearing spurs occurs in late June or early July. The number of fruits on a spur affects the sap concentration of neither spur nor leaf. Sugar and starch are present in slightly greater amounts in the bearing spur than in the non-bearing spur.

Experiments in girdling nursery apple trees showed that this treatment, regardless of the season, caused an increased concentration of sap in the parts above the girdle, and a decreased concentration in the parts below. Etherisation of young Jonathan apple trees had little effect upon the concentration of either twig or leaf sap.—C. W.

670. Couleur et sexe des fleurs. L. Blaringhem (*Compt. rend. soc. biol.*, 1920, **83,** 892-3).—The flowers of *Dianthus barbatus*, L., are markedly protandrous, the stamens maturing about a week before the carpels. While the stamens are mature the flowers are white, but when the carpellary condition is reached the flower changes suddenly to red. Flowers of *Pulmonaria*, *Myosotis*, *Ribes sanguineum*, and *Weigelia* also exhibit changes in colour with age.—W. S.

GENETIC FACTORS

671. Bud Selection, with Special Reference to the Apple and Strawberry. V. R. Gardner (Univ. Missouri Agric. Expt. Sta., *Res. Bull.*, **39,** 1920, 1-30).—This article reports upon a series of bud-selection experiments begun by the Missouri Agric. Expt. Sta. with apples and strawberries in 1895, and a corresponding series of experiments begun by the Oregon Agric. Expt. Sta. in 1913.—C. W.

672. Variegation in Certain Cultivated Plants. M. Balasubramanyam (*J. Ind. Bot.*, 1920, **1,** 325-9).—The variegated leaves of certain commonly cultivated plants in Madras show that very frequently there are in the leaf, not two kinds of mesophyll tissue, as usually stated, but three.—C. W.

ENVIRONMENTAL FACTORS

673. Growth of Seedlings in Wind. L. Hill (*Proc. Roy. Soc.*, 1921, **92B,** 28-31).—From various experiments carried out with cress seedlings grown on lampwick, it was concluded that the stunting effect produced by wind is due not only to a less favourable condition of moisture, but also to greater cooling.—G. E. B.

674. A Contribution to the Ecology of the Upper Gangetic Plain. W. Dudgeon (*J. Ind. Bot.*, 1920, **1,** 296-324).—The author finds that the vegetation of a large part of the Upper Gangetic Plain is influenced and determined as much by biotic as by climatic factors. The climatic factors are periodic in distribution, and produce 3 distinct

seasons—viz., a rainy season, a cold season, and a hot season. The vegetation is characterised by a distinct seasonal succession, as a result of the pronounced climatic seasons. Many photographic illustrations are given.—C. W.

675. The Aquatic Vegetation of the English Lakes. W. H. Pearsall (*J. Ecol.*, 1920, **8**, 163-201).—A consideration of the types of vegetation met with in the English lakes in relation to the factors of the environment. It is concluded that the distribution of vegetation is primarily governed by the nature of the substratum, the reaction of which depends on the sediments deposited on it, and on the organic matter it contains. With most of the plants considered light is a factor of secondary importance, but may limit the depth to which plants descend. Temperature conditions are of little significance beyond retarding development during the early summer. Owing to the low concentration of the waters in nutrient substances is to be attributed the absence of free floating vegetation.—W. S.

676. The Significance of the Calcicolous Habit. E. J. Salisbury (*J. Ecol.*, 1920, **8**, 202-15).—An address.—W. S.

677. Über den Einfluss verschiedener Standweiten auf die Rübenernte. J. K. Greisenegger (*Öster.-ungar. Zeitsch. f. Zuckerind.*, 1920, **47**, 11-5).—Root and leaf increases with increasing space per beet, but sugar content and purity of the juice decrease; on the contrary, the increase in yield of roots, leaves, and sugar per unit surface with decreasing space per beet is not inconsiderable.—W. S. (*Ber. ü. d. ges. Physiol.*).

678. Welchen Einfluss übt eine verschiedenen Tageszeiten erfolgende Abhaltung des direkten Sonnenlichtes auf die Entwicklung der Zuckerrübe aus. J. K. Greisenegger (*Öster.-ungar. Zeitsch. f. Zuckerind.*, 1920, **47**, 44-53).—The stronger the shading of the beets and the longer it lasts the stronger is the retardation of the growth in bulk, the root being more strongly influenced than the leaves. Cutting off the morning sun impairs the yield much more than cutting off the afternoon sun for the same time. Cutting off both morning and afternoon sun had a relatively stronger effect on retarding root growth.—W. S. (*Ber. ü. d. ges. Physiol.*).

THE SOIL

679. Observations on the Soil Acidity of Ericaceæ and Associated Plants in the Middle Atlantic States. E. T. Wherry (*Proc. Acad. Nat. Sci.*, Philadelphia, 1920, **72**, 84-111). **Soil Tests of Ericaceæ and other Reaction-Sensitive Families in Northern Vermont and New Hampshire.** *Ibid.* (*Rhodora*, 1920, **22**, 33-49).—The acidity of a number of soils is correlated with the presence or absence of a number of Ericaceous and other species. —W. S.

680. Residual Effects of Carbon Dioxide Gas Additions to Soil on Roots of Lactuca sativa. H. A. Noyes and J. H. Weghorst (*Bot. Gaz.*, 1920, **69**, 332-6).—It was found in pot cultures that roots grew abnormally in soil which had been treated thoroughly with CO_2 9 months previously. Photographs are given. These roots have a very short tap root, and spread more superficially. Such effects may occur in the soil of gardens.—F. F. B.

681. Die Entwicklung der Wurzeln und der Kalkgehalt des Bodens. B. Tacke (*Fühling's Landw. Ztg.*, 1920, **69**, 58-9).—The author suggests that the comparatively shallow root system of many cultivated plants growing on high moor soil is due to the presence of free humic acid in the subsoil.—C. W.

682. Analyses of One Hundred Soils in Allen County, Indiana. R. H. Carr and V. R. Phares (*Proc. Indiana Acad. Sc.*, 1918, 151-9).—The scope of this article is indicated by its title.—C. W.

683. Bacteria in Frozen Soil. H. A. Noyes (*Proc. Indiana Acad. Sc.*, 1918, 110-6).—The data reported in this paper does not prove that the number of bacteria present in soil is increased when the soil is frozen.—C. W.

684. Theoretische Hinweise zur Frage der Wirkung einer Bodenimpfung mit freilebenden stickstoffsammelnden Bakterien. P. Ehrenberg (*Fühling's Landw. Ztg.*, 1920, 161-5).—Theoretical discussion of the effect of inoculation of the soil with nitrogen-fixing bacteria.—C. W.

685. Number of Colonies for a Satisfactory Soil Plate. H. A. Noyes and G. L. Grounds (*Proc. Indiana Acad. Sc.*, 1918, 93-101).—Gives results of tests which show that 30 is near the optimum number of colonies for a petri plate 100 mm. in diameter.—C. W.

PATHOLOGY

686. The Relation of the Health of the Host and other Factors to Infection of Apium graveolens by Septoria Apii. H. E. Thomas (*Bull. Torrey Bot. Club*, 1921, **48**, 1-29).—Includes paragraphs dealing with the relation of age of tissue, temperature, etc., to infection of celery by *Septoria Apii*.—C. W.

687. The Barberry and its Relation to the Stem Rust of Wheat in Indiana. F. J. Pipal (*Proc. Indiana Acad. Sc.*, 1918, 63-70).—Gives records of the association of the barberry with the spread of *Puccinia graminis*.—C. W.

688. Diseases of Apples in Storage. C. Brooks, J. S. Cooley, and D. F. Fisher (U.S. Dept. Agric., Bur. of Plant Industry, *Farmer's Bull.*, **1160**, 1920, 1-24).—Gives a brief description of the various diseases of apples in storage, including several "physiological" diseases such as "bitter-pit," "drought-spot," "scald," etc.—C. W.

BOOK REVIEWS

Laboratory Manual of the Technic of Basal Metabolic Rate Determinations. By Walter M. Boothby and Irene Sandiford. Pp. 111. W. B. Saunders Company, 1920. Price 24s. net.

This book contains a detailed description of the technical methods employed and recommended by the writers for determining basal metabolism in man by indirect calorimetry. Their method consists essentially in collecting expired air in a gasometer (the Tissot method), and analysing its composition with the aid of Haldane's apparatus. The clinical importance of a knowledge of the basal metabolism in many diseases, notably hyperthyroidism and diabetes, is rapidly becoming recognised, and this extremely lucid book should be of great value to clinicians who wish to determine basal metabolism.—F. A. B.

Advanced Lessons in Practical Physiology for Students of Medicine. By Russell Burton Opitz. Pp. 238. W. B. Saunders Company, 1920. Price 18s. net.

This book contains a comprehensive course of practical experimental work. Much of it deals with experiments on anæsthetised mammals, and is therefore inapplicable to class work in this country. A valuable feature of the book is the large amount of space devoted to the special senses, a side of physiology which the English student is apt to neglect. The author takes the view that a knowledge of the nature of the principles illustrated in the different experiments, and the deductions to be drawn from such experiments, should be gained by discussion between teacher and student at the end of the lesson. For this reason an account of the bearing of any particular experiment has been purposely omitted by the author. It should be added that the book is admirably illustrated.—F. A. B.

Investigation of Central Nervous System. I. Methods and Instruments. By R. H. Clarke. **II. Atlas of Photographs of Sections of Cranium and Brain of Rhœsus Monkey.** By R. H. Clarke and E. E. Henderson. Johns Hopkins Hospital Reports. Special Volume. Pp. 172, 52 plates. Baltimore: J. Hopkins Press, 1920.

Physiologists in general, and members of our Physiological Society in particular, who have seen Dr. Clarke's instruments will be familiar with his work and with his successful efforts in the " stereotaxic " direction to render operative procedures accurate. They will therefore welcome this ample description of the instruments used and results obtained. The earliest paper on the subject was written by the author in conjunction with the late Sir Victor Horsley (*Brain*, 1908, **31**), and part of the atlas has already appeared in *J. f. Psychol. u. Neurol.*, 1914, **21**, 273 *et seq.* The work has been hindered by the war, and congratulations are due to the authors on their achievement.—W. D. H

Physiological Reviews. Edited for the American Physiological Society. Vol. I., No. 1. Waverley Press, Baltimore, U.S.A. Subscription price, $6 per vol. for U.S.; $6·25 for Canada; $6·50 for other parts; $2·50 per single no. net, post paid in all cases.

The long-expected first number of this journal is just to hand, and we extend to it a hearty welcome. It is not a rival to our own publication, but its complement. The subjects dealt with in the present issue are the Origin and Conduction of the Heart Beat (Eyster and Meek), Anaphylaxis (Wells), Currents in the Eye (Sheard), Activity of Capillaries and Venules (Hooker), and the CO_2 Carriers of the Blood (D. D. Van Slyke). All these subjects are of immediate interest to-day, and all are treated in masterly style with bibliography appended in each case. Dr. Hooker and his colleagues on the editorial staff are to be heartily congratulated on the birth of what promises to be a most useful and healthy offspring. In most cases, the articles will be catalogued in these pages for reference by title only. In some cases, where an independent line is taken by an author on vexed questions, a short abstract will be added. That, for example, has been done in our present issue in reference to Dr. Van Slyke's article on CO_2 carriers.—W. D. H.

The Physiology of Protein Metabolism. By E. P. Cathcart. New Edition. Monographs on Biochemistry. Pp. 196. Longmans, Green and Co., London, etc., 1921. Price 12s. 6d. net.

This book was first published in 1912. Since then a good deal of water has flowed under the bridges, and the present volume is practically a new book. Physiologists owe Prof. Cathcart a deep debt of gratitude for undertaking such a laborious piece of work. The bibliography alone occupies 25 pages, which gives one some idea of the literature which has to be waded through in order to elucidate this admittedly difficult subject. The subject is difficult on account of the inherent complexity of the protein molecule, and still more so because the views hitherto expressed on certain of its metabolic aspects are multiple, and leave much which is still unexplained. The compression of so much into a well-digested review of 148 pages is indeed a feat, and the author is to be congratulated on the outcome of his task. His writing is clear, his points are lucidly put, and the text bears no impress of compression. His book is not only a well of knowledge for reference, but one written by a physiologist with wide personal experience on the subject he deals with.—W. D. H.

Annual Reports on the Progress of Chemistry (1920). Vol. XVII. Issued by the Chemical Society, 1921. Pp. 264. London: Gurney and Jackson.

This useful annual is always welcome. The two sections most interesting to our readers on physiological chemistry and vegetable physiology are from the pens of

Professor Barger and Dr. E. J. Russell respectively. We note with regret the announcement of the death of Dr. J. C. Cain, who for so many years has acted as Editor of these Reports and of the Journal of the Chemical Society.—W. D. H.

Vegetation of Philippine Mountains. By William H. Brown. Pp. 434. Manila: Bureau of Printing, 1919.

This work is a record of observations on the relation between the environmental factors and the types of vegetation at different altitudes on the mountains of the Philippine Islands. Observations were made of various environmental factors—temperature, humidity, light intensity, rainfall, soil composition and soil moisture, and wind velocity—in the environments of the different types of vegetation met with, while the rate of evaporation in the different habitats was also determined. The research described is a very noteworthy attempt at a correlation of vegetation and environment, and will be read with much interest by plant physiologists and ecologists.—W. S.

Scurvy, Past and Present. By A. F. Hess. Pp. 279. London and Philadelphia: J. B. Lippincott Company, 1920. Price 18s.

The work done by the author and his colleagues in relation to scurvy is well known and appreciated. It is incorporated in this timely book. Not the least important of the practical points urged are the ever-present danger of infantile scurvy (due mainly to the use of patent foods), the necessity for distinguishing it from rickets, and of anti-scorbutic treatment as a cure and prevention.—W. D. H.

Elemente der wissenschaftlichen Botanik. Band I. Anatomie und Physiologie der Pflanzen. By Julius Wiesner. Edited by K. Linsbauer. Pp. xvi, 412. 6 vollst. und verm. Aufl. Wien und Leipzig: Alfred Hölder, 1920. Price M. 24.

The appearance of the 6th edition of the volume on anatomy and physiology of the Vienna botanical text-book is noted in *Ber. ü. d. ges. Physiol.*, and the volume is there favourably reviewed.—W. S.

Kurzes Lehrbuch der chemischen Physiologie. By E. Schmitz. 334 Seiten. Berlin: Verlag von S. Karger, 1921.

The book gives a short but well-arranged and clear summary of the results and the present state of knowledge of the biochemical sciences with regard to all parts of physiology.—H. W.

Ergebnisse der Physiologie, 1920, 18. Edited by L. Asher and K. Spiro. Pp. xxix, 324. Bergmann. M. 113.

In addition to obituary notices of Ivan Christian Bang, Luigi Luciani, and Paul Grützner, there are articles by Tigerstedt on the circulation of the blood in the capillaries and veins, by Magnus-Alsleben on the Eck fistula, by Mangold on animal hypnosis, by Rosenfeld on cystinuria, and by Möllendorff on vital staining.—C. L. E.

Archiv für (Anatomie und) Physiologie.

This periodical ends with the current number (1919, Heft 5-6), and will in future be absorbed by *Pflüger's Archiv für die gesammte Physiologie.*—C. L. E.

American Journal of Hygiene. Vol. I. 1921. Edited by William H. Welch, Johns Hopkins University. To be issued bimonthly. Published by Johns Hopkins Press, Baltimore, Md., U.S.A. $6 per vol.; $6·50 for abroad.

We have pleasure in acknowledging receipt of the first issue of this journal, and of extending to the new enterprise a welcome. Physiological papers which appear in it will be duly abstracted in these columns.—W. D. H.

H. K. LEWIS & CO., LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

689. Medical Research and Education. S. Vincent (*Middlesex Hosp. J.*, October, 1920; reprint, pp. 14).—An introductory address. The necessity for teachers having time for research is insisted on.—W. D. H.

690. Recent Advances in the Physiology of Respiration, Renal Secretion, and Circulation. J. S. Haldane (*Brit. Med. J.*, 1921, i., 409-13).—This is a lecture in which the regulation of the composition of the blood by the lungs and kidneys is described. The views expressed are based chiefly on the work of the lecturer and his colleagues. —D. H. de S.

691. Importance of the Infinitely Little. W. D. Halliburton (*Lancet*, 1921, i., 627-30; *Brit. Med. J.*, 1921, i., 449-52).—Mackenzie-Davidson Memorial Lecture delivered before Section of Electrotherapeutics, R.S.Med. To those dealing with X rays and radium emanations, the importance of the quantitatively infinitesimal was regarded as appropriate. Illustrations from other departments of medical science illustrate the same truth—*e.g.*, in the case of hormones, vitamins, poisons acting on capillaries, etc. —W. D. H.

692. Der körper-, blut- und zellfremde Zustand. E. Abderhalden (*Pflüger's Arch.*, 1920, **185,** 322-3).—General remarks on material which is distinguished either by chemical constitution, chemical structure, or physical state as foreign to blood or cell constituents. —C. L. E.

693. Newer Aspects of Some Nutritional Disorders. A. F. Hess (*J. Amer. Med. Assoc.*, 1921, 693-700).—A review. While emphasising the importance of collaboration between the laboratory and the clinic, the danger of drawing sweeping conclusions regarding human nutrition from the results of laboratory experiments is pointed out. —C. L. E.

694. The Controlling Factors in Amphibian Metamorphosis. J. F. Fulton, Jr. (*Endocrin.*, 1921, **5,** 67-84).—A review.—W. D. H.

695. Transplantation and Individuality. L. Loeb (*Biol. Bull.*, 1920, **40,** No. 3).—A summary is given of the results obtained in experiments in which skin, thyroid, uterus were transplanted in individuals which showed a graded relationship with each other. In particular the results of syngenesio-transplantation, of multiple and successive transplantations, are discussed. On the basis of these facts, a theory is developed of the interaction of tissues. The relation of contact substances and hormones to the individuality differential is analysed. Added to this is a suggestion as to the relation of contact substances to changes in old age. This is followed by a discussion of the inheritance of the individuality differential and by an analysis of the specifically adapted substances. Conclusions as to the phylogenetic and ontogenetic evolution of the individuality differential and as to the significance of the individuality differential in fertilisation are arrived at. The lack of the homoio-sensitiveness in certain mammalian tumours has a bearing on the question of the potential immortality of somatic cells. The character of the growth curves in dependence upon the spectrum of relationships is discussed, and cellular and psychical discernment of individuality is contrasted.—W. D. H. (*W. I.*).

696. Pioneers in Embryology. C. M. Jackson (*J. Amer. Med. Assoc.*, 1921, **76,** 497-500).—Deals chiefly with Aristotle, Harvey, and Von Baer.—C. L. E.

697. The History of Anaphylaxis. Anon. (*J. Amer. Med. Assoc.*, 1921, **76,** 380).—C. L. E.

APPARATUS AND METHODS

698. Beschreibung eines Kaukraftmessers. K. Hürthle (*Pflüger's Arch.*, 1921, **187,** 75-9).—A modified dynamometer for recording or measuring power of mastication.—C. L. E.

699. Apparatus to Show Ciliary Activity. O. Inchley (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxvii.-viii.).—A simple apparatus (figured) in which a wheel is rotated by a strip of a ciliated membrane. Oxygenated Ringer's solution drips on the latter.—W. D. H.

700. Einfache Apparate zur Gasanalyse und Mikrorespirometrie in bestimmten Gasgemischen, und über die Bedeutung des Hämoglobins beim Regenwurm. H. Jordan and B. Schwarz (*Pflüger's Arch.*, 1920, **185,** 311-21).—Modification and adaptation of Krogh's micro-gas analysis (capillary) method. Worms survive many hours' exposure to pure CO; on subsequent return to air the oxygen usage is little if at all reduced, although the Hb persists as COHb. But if exposed to low oxygen pressure, previous treatment with CO leads to reduction of oxygen consumption; it is inferred that Hb is only used as an oxygen carrier under conditions of low oxygen environment.—C. L. E.

701. A Differential Balance for Use with Martin's Bicycle Ergometer. E. H. J. Schuster (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxci-ii).—This takes the place of the usual spring balances. Without the illustration a description is not possible.—W. D. H.

702. Die Elektronenröhre als grosser veränderlicher Widerstand. W. Steinhausen (*Pflüger's Arch.*, 1920, **185,** 70-3).—By altering the potential of the charge on the grating the resistance of the tube can be altered at will. As the tube has not the inherent drawbacks of capacity, induction and polarisation it may be usefully employed as a variable high resistance for altering the current passing through a tissue.—C. L. E.

703. The Production of Electromotive Force by the Movement of Salt Solution Past Silver Electrodes. W. E. L. Brown and A. V. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cix).—When a salt solution is run past silver electrodes an E.M.F. is produced, the electrode past which the stream runs being positively charged. The origin of this phenomenon is discussed.—E. P.

704. On a Probable Error in Determinations by Means of the Hydrogen Electrode. C. L. Evans (*J. Physiol.*, 1921, **54,** 353-66).—Electrometric determinations of the reaction of blood or bicarbonate solutions give results P_H 0·2 lower than those given by the indicator method (Abstract No. 2200, Vol. V., p. 350). Calculations in which the values taken for the apparent dissociation constant of H_2CO_3 and for the degree of ionisation of $NaHCO_3$ were those determined by the conductivity (and not by the H electrode) method agree with the indicator, and not with the electrometric results. The discrepancy is probably due to catalysis in the hydrogen electrode, formic acid being produced.—C. L. E.

705. Class Exercises on Blood Reaction. C. L. Evans (Proc. Physiol. Soc., *J. Physiol.*, 1921, **54,** cxxxv-vii).—Simple exercises with the indicator method (Abstract No. 2200, Vol. V., p. 350).—C. L. E.

706. Colorimetric Determination of Hydrogen-Ion Concentration by Means of a Double-Wedge Comparator. G. D. Barnett and C. W. Barnett (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 127-31).—The method of determining H-ion concentration colorimetrically without the use of buffer solutions is extended to the group of indicators

described by Clark and Lubs. Values of the dissociation constant at 20° of each of the indicators are given. A double glass wedge comparator for making such determinations is described.—D. H. de S.

707. Zur Bürkerschen Methodik der Blutkörperchenzählung. B. Feucht (*Pflüger's Arch.*, 1921, **187,** 139-61).—The Bürker method has many advantages over the Thoma—elimination of filling error, saving of time, greater ease of manipulation. The empirically estimated probable error in Bürker's method is 50% less than the "theoretically smallest possible probable error" for Thoma's instrument. Counting of 80 squares is sufficient except in high-grade anæmias.—C. L. E.

708. Preparation of Collodion Sacs for Use in Bacteriology. F. L. Gates (*J. Exp. Med.*, 1921, **33,** 25-43).—A standardised method for the preparation of collodion sacs for intraperitoneal incubation, etc., is described; various factors influencing permeability were tested.—C. L. E.

709. A Mechanical Measuring Instrument for Sterile Liquids. F. L. Gates (*J. Exp. Med.*, 1921, **33,** 45-9).—An adjustable syringe for serological measurements.—C. L. E.

710. Estimation of Ca and Mg in Small Amounts of Serum or Plasma. B. Kramer and F. F. Tisdall (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 44-8).—A modified McCrudden technique (*J. Biol. Chem.*, 1909, **7,** 83), in which ashing is unnecessary.—W. D. H.

711. Estimation of Glucose by Folin and Wu's Method. M. Borde (*Bull. soc. pharm.*, Bordeaux, 1920, **58,** 214-25).—$NaPO_3$ or picric acid may be used in place of Na_2WO_4 for the removal of protein previous to the estimation of glucose.—W. D. H. (*Chem. Abstr.*).

712. A Modification of Folin's Uric Acid Method. H. Jackson, Jr., and W. W. Palmer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 126-7).—By dialysing Folin's solution under special conditions and evaporating the solution so dialysed a reagent was obtained. A similar, though not identical, reagent was prepared by boiling down Folin's solution and filtering off the precipitate. When mixed in the proper proportions, these two substances yield a reagent superior to Folin's, since there is no precipitate, and the colour developed with a given quantity of uric acid is about $4\frac{1}{2}$ times as intense as that developed in Folin's method, and does not fade over a period of many hours. The method of blood analysis is modified. No sodium carbonate is used, the cyanide furnishing the requisite alkalinity. Benedict's standard must be used. The cyanide must be measured to an accuracy of 0·1 c.c.—D. H. de S.

713. Estimation of Chlorine in Solid Tissues. R. D. Bell and E. A. Doisy. **Estimation of Chlorides in Trichloracetic Acid Filtrates from Whole Blood and Plasma.** M. Smith. **Estimation of Chlorides in Blood and Plasma.** J. C. Whitehorn. **Estimation of Chlorides in Blood-Plasma.** J. H. Austin and D. D. Van Slyke (*J. Biol. Chem.*, 1921, **45,** 427, 437, 449, 461-3).—The first of these methods consists of oxidation of the tissues by concentrated H_2SO_4 and collecting the chlorine by passing the gases through carbonate solution. The other 3 consist in precipitating proteins by trichloracetic acid, tungstic acid, and picric acid respectively. The chlorides are estimated by $AgNO_3$, and titration of excess of silver by potassium iodine in the first, second, and fourth methods, and by Volhard's method in the third one.—H. E. R.

714. The Estimation of Bile Acids in Bile. C. L. A. Schmidt and A. E. Dart (*J. Biol. Chem.*, 1921, **45,** 415-21).—The bile acids are hydrolysed by alkali, and the amino-N set free by HNO_2 is estimated. The S is estimated, from which the taurine N is calculated. The difference between total amino-N and taurine N less 3% gives the glycine N in the bile acids.—H. E. R.

715. Simple Process for Rendering Permanent Golgi-Cox Preparations. C. da Fano (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxiii).—The method is described in detail.—E. P.

CHEMICAL

716. Über das Kristallisationsvermögen hochmolecularer Verbindungen. R. O. Herzog and K. Becker (*Zeit. physiol. Chem.*, 1921, **112,** 231-5).—Theoretical discussion. —H. W. D.

717. Erwiderung auf die Bemerkung des Herrn H. Handovsky zu meiner Arbeit: Die kolloidchemische Bedeutung des physiologischen Ionenantagonismus, usw. S. M. Neuschlosz (*Pflüger's Arch.*, 1921, **187,** 136-8, compare Abstract No. 2453, Vol. V., p. 386; also Abstract 722, below).—Those interested must consult original.—C. L. E.

718. Die innere Reibung gelatinierender Lösungen. W. R. Hess (*Kolloid-Zeitsch.*, 1920, **27,** 154-63).—Like blood, a 2% gelatin or 5% starch solution that has been made up some hours since has apparently a higher viscosity when the transpiration pressure is low than when it is high. The meaning of this is discussed.—C. L. E.

719. Versuche zum Nachweis elektroosmotischer Vorgänge bei der Plasmolyse. R. Collander (*Pflüger's Arch.*, 1920, **185,** 224-34).—Electrolytes which (like acids, Na citrate, salts of Al and La) give abnormal osmosis with dead membranes behave normally with regard to the plasmolysis of cells of the epidermis of *Rhœo.*—C. L. E.

720. Beitrag zur Theorie der Viskosität heterogener Systeme. W. R. Hess (*Kolloid-Zeitsch.*, 1920, **27,** 1-11).—Mathematical discussion of the influence of size and volume of suspended particles, and of the viscosity of the dispersion medium on the viscosity of a suspension.—C. L. E.

721. Colloids and Colloidal Electrolytes. J. W. McBain (*Nature*, 1921, **107,** 48).—An elementary account of the subject, chiefly with reference to soaps.—C. L. E.

722. Bemerkungen zu der Arbeit von S. M. Neuschlosz: Die kolloidchemische Bedeutung des physiologischen Ionenantagonismus und der äquilibrierten Salzölsungen. H. Handovsky (*Pflüger's Arch.*, 1920, **185,** 7-10; see Abstract No. 2453, Vol. V., p. 386). —The author considers that N.'s balancing ratio of K:Na::1:20, if not erroneous, is fortuitous, and has no special biological significance in his experiments on lecithin.—C. L. E.

723. Die Verschiebung des Flockungsoptimums des Serumalbumin durch Alkaloide, Farbstoffe und andere organische Elektrolyte und die Wirkung von Nichtelektrolyten. R. Labes (*Pflüger's Arch.*, 1921, **186,** 98-111).—The P_H at which aggregation takes place is altered to a less acid one by various alkaloids, and to a more acid one by anions, such as phenols, salicylic acid, and eosin. All the anions increased the aggregation, while kations had a variable action. Non-electrolytes do not alter the P_H needed for aggregation, but widen the limits (*i.e.*, favour the aggregation) to an extent parallel with their surface tension.—C. L. E.

724. Untersuchungen über die Beziehung zwischen der aussalzenden und flockung-hemmenden Wirkung anorganischer Anionen auf Eiweisslösungen. R. Labes (*Pflüger's Arch.*, 1921, **186,** 112-25).—The inhibitory influence (SO_4>Cl) on flocculation (Abstract No. 1263, Vol. IV., p. 205) is converted into a favouring influence (SO_4>Cl) when high salt concentrations are used; this is due to abstraction of water by the salt. The more ready salting-out in acidified solutions is accounted for by increased adsorption of the anion; salts like cupric chloride with a kation that combines with protein have an optimal salting-out effect over an alkaline range.—C. L. E.

725. Eiweissprobleme. O. Loew (*Chem. Ztg.*, 1920, **68,** 418-9).—The proteins of cell protoplasm are regarded as being derived by condensation of the (unknown) aldehyde of asparagine. The labile nature of the aldehyde group is enhanced by the presence of the amino-groups. The view is supported by the observation that all substances which in dilute solution react with aldehyde or amino-groups are poisonous to protoplasm.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

726. The Solution of Casein by Sodium Carbonate: An Example of Reversible Coagulation. J. Mellanby (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxvi).—Casein dissolves in sodium carbonate without evolution of CO_2; the solution depends on the behaviour of Ca ions. The bearing of these facts on the transport of CO_2 in blood is pointed out. —E. P.

727. The Decomposition of Carbonates by Acidic Caseinogen. J. Mellanby (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxx).—Proteins can play the part of acids capable of decomposing carbonates, and these salts of proteins can carry CO_2.—E. P

728. Chemical and Molecular Behaviour of Casein. J. Loeb (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 97-8).—Acids and alkalis combine with casein by the same purely chemical forces of primary valency as they combine with crystalloids.—D. H. de S.

729. Nitrogen-Containing Carbohydrate Compounds of Protein. O. Schmiedeberg (*Arch. exp. Path. Pharm.*, 1920, **87,** 1-30).—From various proteins a compound possessing the properties and characteristics of hyaloidin, as derived from the echinococcus, can be isolated. Preliminary treatment of the protein results in a mixture of hyaloidin, mucoidin, and melanoidin. The method of separating these three substances is given in detail. Much discussion of their probable structural formula is presented, and various empirical formulæ are given.—W. D. H.

730. The Carbohydrate Radical of Mucoid and Mucin. O. Schmiedeberg (*Arch. exp. Path. Pharm.*, 1920, **87,** 31-46).—The following materials contain hyaloidin($C_{26}H_{46}N_2O_{20}$): protomucoidin (Leathes), submaxillary mucin, sputum mucin, metalbumin, albumin mucoid, ovomucoid, and seromucoid. Hyaloidin is firmly bound to protein or to protein derivatives. Four types of union are recognised: (*a*) In albumin, globulin, fibrin, whose hyaloidin content is unknown; (*b*) in mucin and mucoid, which are rich in hyaloidin; (*c*) in mucoidin; and (*d*) in protomucoidin.—W. D. H.

731. The Relation of Hyaloidin to the Formation of Chondroitin-Sulphuric Acid, Collagen, and Amyloid in the Body. O. Schmiedeberg (*Arch. exp. Path. Pharm.*, 1920, **87,** 47-73).—The possible origin of chondroitin-H_2SO_4 is discussed. Apparently the formation of chondroitin-H_2SO_4 in the body is dependent upon the formation of collagen, and the proteins which give rise to collagen contain hyaloidin. The view is expressed that chondroitin-H_2SO_4 arises as a by-product in the conversion of the protein into collagen, which explains the wide distribution of chondroitin-H_2SO_4 in tissues rich in collagen and in those exhibiting amyloid degeneration.—W. D. H. (*Chem. Abstr.*).

732. Shift of Absorption Bands of OHb and COHb with Temperature. H. Hartridge (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxviii-xxx).—The shift in both cases is towards the red as the temperature rises. This is attributed to an intramolecular change.—W. D. H.

733. Melanin. E. Salkowski (*Virchow's Arch.*, 1920, **228,** 468-75; compare Abstract No. 1761, Vol. V., p. 276).—The final purification of melanin may be carried out with acid alcohol as well as glacial acetic acid. Melanin contains organically bound P. The function of the cell nucleus in the production of melanin is concerned with the P fraction. Melanin is not closely related to the proteins, since it contains neither the phenyl groups nor tryptophan, and upon oxidation yields fatty acids of the series $C_nH_{2n}O_2$. Oxidation experiments do not demonstrate the presence of hydroxyphenyl groups. The normal liver contains several pigments; the pigment obtained by treating the liver according to the method of isolation of melanin is not melanin.—W. D. H. (*Chem. Abstr.*).

734. Estimation of Histidine. W. E. Thrun and P. F. Trowbridge (*J. Assoc. Off. Agric. Chem.*, 1920, **4,** 194-5).—The method is used in conjunction with the Van Slyke method, and depends on the absorption of bromine by histidine and cystine. A portion of the solution containing the bases of a coagulable protein is treated with bromide-

bromate solution and HCl, and after 15 minutes the excess of bromine is titrated. Cystine is estimated separately in another portion of the solution by estimating the S. One molecule of cystine absorbs 10 atoms of bromine, whilst 1 molecule of histidine absorbs 2 atoms of bromine; there is some evidence, however, that the latter absorption somewhat exceeds 2 atoms of bromine.—W. D. H. (*J. C. Soc.*).

735. Separation of Ptomaines from Vegetable Alkaloids. A. Jonescu (*Bull. Soc. Chim. România*, 1920, **2**, 82-9).—The author examined the influence of certain enzymes on the ptomaines and on strychnine, coniine, and morphine as typical of 3 classes of alkaloids, and their influence on the activity of the enzymes. The material was acted on for 24 hours by the enzyme under the optimum conditions, and the alkaloids and ptomaines then extracted by Dragendorf's method. Invertase and amylase have no action on the ptomaines, whilst pepsin weakens their reducing power without affecting their alkaloidal character. Tyrosinase and peroxidase destroy only the reducing power of the ptomaines. Neither ptomaines nor alkaloids affect the enzymes, and the vegetable alkaloids are not affected by the enzymes.—W. D. H. (*J. C. Soc.*).

736. Nature of Enzymes. M. Herzog (Monograph, Chicago, 1920, pp. 107).—The author regards enzymes as living entities, the real basis of life.—W. D. H. (*Chem. Abstr.*).

737. Sur les pouvoirs liquéfiant et précipitant de la papaïne. E. Pozerski (*Compt. rend. soc. biol.*, 1920, **83**, 657-60).—Papain contains a constituent with liquefying powers which is destroyed at a temperature of 90° to 95°, and also a precipitating agent, the activity of which is only developed after heating, and is destroyed by the presence of the unheated material.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

738. Catalase in Fish. P. C. Stockstad (*Tids. Kem.*, 1920, **17**, 181-7).—A number of fishes examined contained catalase. Those with highest fat and esterase contain least. The reaction is unimolecular, though the herring is an exception, perhaps because of some undetected disturbing phenomenon.—W. D. H. (*Chem. Abstr.*).

739. Über den Reaktionsverlauf bei Arginasewirkung. R. E. Gross (*Zeit. physiol. Chem.*, 1921, **112**, 236-51).—Constant values for k in the equation governing monomolecular reactions were not obtained on following the decomposition of arginine by arginase. Arginine is never completely decomposed by the enzyme, 15 to 30% remaining at the end of the reaction. Addition of urea has little effect on the reaction, but addition of ornithine strongly diminishes the action of the enzyme.—H. W. D.

740. Versuche zur Darstellung hochaktiver Saccharasepräparate. V. Über den Phosphorgehalt gereinigter Saccharaselösungen nach erschöpfender Dialyse und über Mikrobestimmungen des Phosphors. H. v. Euler and O. Svanberg (*Zeit. physiol. Chem.*, 1921, **112**, 282-94).—After exhaustive dialysis of saccharase solutions, the organically combined phosphorus of the solid matter is roughly proportional to the activity of the preparation. Speculations as to the constitution of the enzyme are put forward.—H. W. D.

741. Uber die Charakterisierung von Amylaselösungen. H. v. Euler and O. Svanberg (*Zeit. physiol. Chem.*, 1921, **112**, 193-230).—It is proposed to represent the activity (Sf.) of amylase solutions by the following expression: $\text{Sf.} = \frac{k \times \text{g. maltose}}{\text{g. prepn.}}$, where k = mean value of monomolecular reaction coeff.; g. maltose = gms. maltose produced in the reaction; g. prepn. = gms. of solid matter in the enzyme preparation present in the reaction mixture.—H. W. D.

742. Über den Einfluss neutraler Alkalisalze auf diastalische Fermente—I., II., III. A. Hahn and R. Michalik (*Zeit. Biol.*, 1920, **71**, 287,382; 1921, **73**, 10-18).—The optimum reaction is nearly the same for pancreatic and salivary amylase, so also are the accelerating and inhibiting effects of neutral salts. Full details are given for many

salts in the presence of different "buffers." The salts cause their effects by altering the colloidal state of the enzyme; inhibition is produced when the salts flocculate, acceleration when they cause the opposite effect.—H. W.

743. Wirkungsweise und Elektrolytnatur diastatischer Fermente. A. Hahn (*Sitzunsber. d. Ges. f. Morph. u. Physiol. in München*, 1919, **31,** 66).—In diluted buffer solutions more acid than the optimum reaction for the particular ferment, neutral salts accelerated its activity; but in concentrated buffer solutions the neutral salt had a retarding effect. On the alkaline side of the optimum point similar effects were observed, but although the accelerating effect of the neutral salt was much more marked in dilute buffer solutions, it never became reversed in the presence of high concentration of the buffers. The isoelectric point of the ferments can be changed by the action of neutral salts without an appreciable change in the diastatic power or in the value of the reaction optimum. The electrolytic nature of these enzymes, therefore, has little influence upon their activities.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

744. Études expérimentales sur la décomposition de l'amidon en présence de salive calcinée. E. Bachrach (*Compt. rend. soc. biol.*, 1920, **83,** 583).—There is no action if the ash is kept sterile.—C. L. E.

745. Untersuchungen über die Neubildung von diastatischen Ferment ausserhaib lebender Zellen. W. Teschendorf (*Fermentforschung*, 1920, **4,** 184-90).—The apparent production of ferments in the absence of living cells is due to bacterial action.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

746. Influence de quelques bases organiques et de leur chlorhydrate sur l'activité de l'amylase pancréatique. A. Desgréz and R. Moog (*Compt. rend.*, 1921, **172,** 551-3).—The chlorides of trimethylamine, monomethylamine, and triethylamine accelerate the action of pancreatic amylase, whereas the bases themselves slow the action of the ferment.—J. A. M.

PHYSIOLOGY OF INVERTEBRATES

747. Serological Behaviour of Amœbæ. W. v. Schuckmann (*Arb. Gesundh. Amt.*, 1920, **52,** 133-62).—Breeding experiments, morphological and cultural behaviour, and immunising experiments are described. The action of an amœbic immune serum on a homologous race of amœbæ is accompanied by a more or less pronounced clotting of the now immobile amœbæ, which, however, is not permanent, since mobility is recovered gradually. The flagellate forms produced by certain races of amœbæ are also specifically influenced by an immune serum prepared with the corresponding amœbæ.—W. D. H. (*J. C. Soc.*).

748. Variations de la susceptibilité aux agents nocifs avec le nombre des animaux traités. Mme. A. Drzewina et G. Bohn (*Compt. rend.*, 1921, **172,** 485-7).—Convoluta and Infusoria were experimented on, the former in sea-water, the latter in ordinary water. The toxic agent used was colloidal silver added to the water. If the organisms in the water were numerous, they were much more resistant to the poison than if they were few in number.—J. A. M.

749. Sulla composizione chimica di alcuni invertebrati marini. F. Botazzi (*Extract from Rep. Sc. Comm. on Nutrition, No.* 10, *of the R. Acc. Lincei*, Roma, 1920, pp. 16).—Analytical tables (water, dry residue, ash, organic substances, total N, and proteins) are presented of a marine alga (*Ulva lactuga*), certain invertebrates—*Phallusia mamillaris*, *Holothuria* (2 varieties), *Stichopus regalis*, *Cerianthus membranaceus*, *Sipunculus nudus*, *Eledone moschata*, *Octopus vulgaris*—and the flesh of the dog-fish (*Scyllium canicula*). The total N in Holothuria is very high (11·5 and 12·7% of fresh material). The protein N is also high. The small amount of proteins found in Stichopus and Phallusia is

attributed to the high water content (90·43 to 94·67%). The protein of molluscs varies between 9 and 10·3%. The protein in the fresh muscles of Scyllium is very high (17·43%); this number was obtained from material which had been previously extracted with an acidulated and concentrated solution of tannin. The number is higher than that of the total organic contents. This the author explains by pointing out that the muscles of Scyllium contain other nitrogenous substances, which are probably precipitated by the acidulated tannin solution together with the proteins. To obtain the exact amount of the proteins contained in the flesh of Scyllium, as well as in the Holothuria, the material should be analysed after extraction with a reagent precipitating the proteins only. The ash of some of the marine invertebrates and of the *Ulva lactuga* is very high, but this is to be attributed to the fact that the body wall of such invertebrates and of seaweed in general contain many mineral substances; and as many of these are carbonates, which during incineration release CO_2, one must assume that the contents in ash registered in the table are somewhat less than the total amount of mineral salts.—C. d. F.

750. Beiträge zur Biologie der Strahlenwirkung. H. Holthusen (*Pflüger's Arch.*, 1921, **187,** 1-24).—Ascaris eggs were exposed to X rays, and the number which survived and developed was noted. It was found that those eggs which were at the equatorial plate stage and at later stages up to complete division were most sensitive. The sensitiveness at these stages was not related to any alteration in oxygen usage as measured by Siebeck's method. Higher temperatures also had an influence in rendering the eggs more sensitive to the rays, which probably explains the known effects of vascularity of the skin in rendering it more sensitive.—C. L. E.

751. Die Bedeutung des Ultraviolett für die Lichtreaktionen bei Gliederfussern. C. v. Hess (*Pflüger's Arch.*, 1920, **185,** 281-310).—Unsuited for these abstracts.—C. L. E.

752. Bioluminescence. IV. The Nature of the Luciferase of Cypridina Hilgendorfii. S. Kanda (*Amer. J. Physiol.*, 1921, **55,** 1-12).—The clear filtrate after precipitation by mercuric chloride of extracts of this organism containing luciferase gives most of the protein reactions. The luciferase is contained in the precipitate produced by phosphotungstic acid, by potassium ferrocyanide and acetic acid, by saturation with magnesium sulphate, by half-saturation with ammonium sulphate, by acetone or alcohol. It is coagulated at about 65° C. It passes slowly through parchment paper. The results do not decide the question whether it is a protein or merely adsorbed on the precipitates produced.—W. M. B.

753. Biology of Fresh-Water Mussels. I. Food Relations of Unionidæ. W. R. Allen (*Biol. Bull.*, 1921, **40,** No. 4).—Mussels in any posture continue ingestion at the same rate, showing that the position of ciliated parts is constant and favourable to ingestion. No asymmetry of ciliated parts due to posture occurs. The control of the quantity of food entering the blood is through the regulation of secretion of digestive juices rather than through regulation of ingestion. Feeding is a nearly continuous process. The condition of the crystalline style is an index of the digestive activity. The nannoplankton is a more important element of the mussel's food than hitherto supposed. Protozoan infusions and the organisms of sewage renew the style. Style renewal follows only upon the introduction of substances usually found in the natural waters, and could not be induced through mechanical stimulation. Temperature is a large element in determining the time necessary for the formation of the style. The gills are of considerable importance in assorting food particles. The unionid crystalline style and style sac have diverged widely in form and function from those of other lamellibranchs.—W. D. H. (*W. I.*).

754. Feeding Habits and Chemical Sense of Nereis virens. A. O. Gross (*J. Exp. Zool.*, 1921, **32,** No. 3).—*Nereis virens* feeds on plants which grow in the vicinity of its

burrows. The sense of taste or chemical sense in Nereis plays a small part, if any, in the finding or selection of food. Nereis is strongly negatively chemotrophic to acids, hydroxides, and salts. It is stimulated much more by KCl than by NaCl—a reverse of the conditions found in the earthworm. This difference is correlated with the high percentage of NaCl in the sea-water to which Nereis is adapted. The general integument of Nereis is sensitive to chemical stimulation, but there is a localisation or concentration of the chemical sense in the palps and tentacles—a condition correlated with their rich innervation, but there are no specialised receptors.—W. D. H. (*W. I.*).

755. Cytophysiologische Beobachtungen an der Hinterleibsdrüsen und den Wandezellen von Priapulus caudatus (Lam). O. D. Hammarsten and J. Runnström (*Bergens Museums Aarbok*, 1917-18, *Naturvid. Raekke, No.* 13, 1920, **2,** 1-15).—The caudal appendage of Priapulus is a respiratory organ; the secretion of the posterior glands serves to bind the walls of the mud tube in which the animal lives. The cells of these glands grow to a large size and are then replaced, the wandering cells serving to bring about the transport of material necessary to this activity.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

756. On Inheritance of Body-Colour in Oryzias latipes. M. Ishihara (*Mitt. der med. fakult. Univ.*, Kyushu, 1917, **4,** 43-52).—The inheritance of the body-colour in cross-breeding of the black, white, and orange varieties of the fish *Oryzias latipes* follows Mendel's law.—G. V. A.

757. The Period during which Stegomyia fasciata can Live at Low Temperatures. P. C. Flu (*Med. u. het Geneesk Lab. te Weltevreden*, Java, 1920, 3e, Ser. A, 495-501).—The investigation arose from the question of storage and transport of fruit in refrigerators, and the possibility of infection from mosquitoes which might also be stored. If the temperature does not rise above 6° C., the Stegomyia dies within 24 hours. Between 7° and 10° they die in 4 days.—W. D. H.

758. On a Volatile Sperm-Stimulating Substance derived from Marine Eggs. G. H. A. Clowes and E. Bachman (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 120-1).—The substance, the exact constitution of which is not yet known, when added to quiescent or attenuated sperm, greatly increases the facility with which the eggs are fertilised by the sperm. It has been obtained from the eggs of the sea urchin, star-fish, and sand dollar. It is non-specific, and is a comparatively simple organic substance.—D. H. de S.

759. Effect of Oxygen Tension on the Toxicity of Sodium Chloride. I. Starr, jr. (*Biol. Bull.*, 1921, **40,** No. 3).—The removal of most of the oxygen from the solution diminishes the toxicity of NaCl, isotonic to sea-water, to Arenicola larvæ. Slight increases in oxygen tension also diminish the toxicity of isotonic NaCl to this organism, while saturation with oxygen markedly increases the toxicity of this solution. A simple method of exposing the organisms to solutions with different oxygen tensions is described. —W. D. H. (*W. I.*).

760. Über das Vorkommen von Tonusmuskeln bei Insekten. W. v. Buddenbrock (*Pflüger's Arch.*, 1920, **185,** 1-6).—The rate of loss of body-weight and the oxygen usage of *Dyxippus morosus* is the same for the tonic standing posture as for the motionless cataleptic state in which the legs do not support the weight of the body.—C. L. E.

761. Mécanisme de l'immunité humorale chez les Insectes. A. Paillot (*Compt. rend.*, 1921, **172,** 397-9).—Certain insects rapidly acquire bacteriolytic power when inoculated with microbes. The author has sought to use this fact in trying to obtain evidence for the existence of the two theoretical substances concerned in immunity, the alexine and sensitising substance (complement) of Bordet. The blood of caterpillars of *Agrotis segetum* inoculated with *B. melolonthæ non liquefaciens* became bacteriolytic for this microbe within 24 hours. The bacteriolytic power was destroyed by heating the blood to 75°, but not at a lower temperature. The addition of normal blood then failed to restore the immune condition. The blood also lost its immune property in a few days

in the living animal, and more rapidly when it was exposed to air. The addition of normal blood was ineffectual in this case, also in restoring the immune condition. These experiments therefore give no support to the view that two substances are concerned in the production of immunity.—J. A. M.

762. Contribution à l'étude de l'immunité humorale chez les insectes. A. Paillot (*Compt. rend.*, 1921, **172,** 546-8).—Further experiments in support of the thesis that in the caterpillars of *Agrotis segetum* immunity can be produced apart from cellular activity and without the production of an antibody (see Abstract 3296, Vol. V., p. 524).—J. A. M.

763. Lichtreaktionen bei Krebsen (Palæmon). A. Fröhlich and A. Kreidl (*Pflüger's Arch.*, 1921, **187,** 102-4).—Camphor and phenol increase the light reactions, of which the most pronounced is that to reduction of illumination.—C. L. E.

764. Pharmakologische Untersuchungen über die Wärmenarkose an marinen Krebsen (Palæmon). A. Fröhlich and A. Kreidl (*Pflüger's Arch.*, 1921, **187,** 90-101).—Heat "narcosis" (paralysis) set in at 36·5 to 37° C., and affected the œsophageal ganglia and commissures. The critical temperature was lowered by immersion in hypotonic sea-water, by excess of Mg, by strychnine, cocaine, chloral, and alcohol, but could in no way be raised. No satisfactory theory is advanced.—C. L. E.

CELLS AND TISSUES

765. Sur la résistance électrique des cellules et des tissus. M. Philippson (*Compt. rend. soc. biol.*, 1920, **83,** 1399).—The resistance of tissues (muscle, liver, erythrocytes) to high-frequency currents diminishes rapidly as the frequency increases.—R. K. S. L.

766. Reaction of Cells to the Galvanic Current in Tissue Cultures. S. Ingvar (*Proc. Soc. Exp. Biol. and Med.*, 1920, **17,** 198-9).—A weak constant galvanic current applied to tissue cultures has a directing influence upon the cell and fibre outgrowth in the cultures, so that this occurs almost entirely along the lines of force in the galvanic field. The cell processes growing towards the anode show morphological differences from those growing towards the cathode. If a weak current, by means of a single conductor, is drawn through the culture, the outgrowth of fibres and cells always takes place perpendicular to the conductor. Electrical forces are considered to take part in the formative processes in morphogenesis.—D. H. de S.

767. Perte de la sécrétion spécifique des cellules cultivées in vitro. C. Champy (*Compt. rend. soc. biol.*, 1920, **83,** 842-3).—Cells of the prostate of the guinea-pig cultivated in blood-serum were found not to give the characteristic reaction with the contents of the seminal vesicles that is observed with the cells of the fresh gland. During cultivation *in vitro*, therefore, the cells lose their specific secretory properties.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

768. Migration of Lymphocytes in Plasma Cultures of Human Lymph Nodes. W. H. Lewis and L. T. Webster (*J. Exp. Med.*, 1921, **33,** 261-9).—The lymphocytes migrated along irregular paths away from the explant at 0·03 to 0·0013 mm. per minute; the nucleus was at the anterior end of the elongated cell.—C. L. E.

769. Post-mortem Autolysis of Cell Granules. O. Freiburg (*Virchow's Arch.*, 1920, **228,** 200-15).—The more highly differentiated parenchyma cells are less resistant to autolysis than the interstitial substance. Liver cells and kidney epithelium lose their nuclei early, while connective-tissue cells, particularly Glisson's capsule, retain their nuclei for a relatively long time. The clasmatocytes are also somewhat resistant. In autolysis, the state of digestion of the animal at the time of death is an important factor. Autolysis of nuclear substances is influenced by temperature, and occurs best

at body temperature, indicating that the ferments concerned are similar to those in the action of complement on hæmolytic amboceptor. The addition of salt solution retards autolysis. The carmine granules are much more resistant than the Altmann granules. The pigment granules present in liver cells behave like the carmine granules. It is extremely difficult to determine the exact relationship between the carmine granules and mitochondria.—W. D. H. (*Chem. Abstr.*).

770. Über den Mechanismus der Einwirkung der Becquerelstrahlen auf die Zellfunktion. W. Engelmann (*Strahlentherapie*, 1920, **11,** 287-91).—The perfusion of blood containing radium emanation through the surviving liver leads to no increase in the production of aceto-acetic acid. An increase is observed, however, if the animal has been given water containing the emanation during the day before the experiment.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

771. The Reticular Material of Developing Blood-Cells. E. V. Cowdry (*J. Exp. Med.*, 1921, **33,** 1-11).—Erythroblasts, leucocytes, and lymphocytes have variable amounts of reticular substance which slowly but constantly changes in shape. The material is probably of a different nature in different cells.—C. L. E.

772. Oxydasereaktion an Monozyten. F. Schlenner (*Deutsch. med. Woch.*, 1921, **47,** 6-7).—The monocytes and the cells from which they originate (reticulo-endothelium of liver, cells of splenic pulp and marrow) give no oxidase reaction, and so differ from granular leucocytes. The best method for applying the test is to take unfixed material, and use a physiological saline solution of α-naphthol and dimethylparaphenylendiamine; counterstain with carbol fuchsin or borax methylene blue.—W. D. H.

773. Ricerche sperimentali sulla fagocitosi—XII. A. Calderone (*Lo Sperimentale*, 1920, **74,** 274-85; see also Parrino and Di Macco, Abstracts Nos. 3310 and 3311, Vol. V., 526).—A study of the influence of dilute solutions of HCl on Eberth's bacilli. Experiments were attended by unexpected results in so far as it clearly appeared that the phagocytic values diminished when bacteria were kept in contact with dilutions of HCl N/50 to N/400 for some hours up to 24, but it gradually increased when the contact was further prolonged. With diluted solutions (N/800 to N/1,000) the opposite phenomenon was noticed, the phagocytic index showing an increase in the first 2 hours and a diminution subsequently. The diminution of the phagocytic index in the first hours of contact of bacteria with not too dilute solutions can be explained, assuming that the chloroprotein which becomes formed has a negative chemotactic power on polymorphonuclear leucocytes. The subsequent increase is very likely due to deep changes in the bacterial protoplasm owing to the prolonged influence of the HCl. There is a coincidence of time between the increase of the phagocytic index and the death of the bacteria experimented upon. The transitory increase of the phagocytic index at the beginning of experiments made with very dilute solutions of HCl remains entirely inexplicable. A similar fact was observed by Oker-Blom (*Zeitsch. f. Immunitätsf.*, 1912) when treating staphylococci with N/1,000 to N/2,000 of sulphuric acid. In conclusion, phagocytosis is influenced, not only by the biological activity of bacteria, but also by changes caused in them by the substances with which they may come in contact and by the length of time during which this contact is prolonged.—C. d. F.

774. Ricerche sui fenomeni fotodinamici. II. Reazioni fotocatalitiche e reazioni fotobiologiche. G. Viale (*Arch. di Sci. Biol.*, 1920, **1,** 259-65).—Continuing his studies on photodynamics (Abstract No. 721, Vol.V., p. 113), the author has investigated the action of certain salts of uranium, iron, and manganese on red blood-corpuscles used as tests, as well as on a simple chemical system consisting of 4 parts of 1% starch and 1 part of 1% KI. The conclusions reached are: The salts of U, Fe, and Mn are not suitable for producing the photodynamic phenomenon in cells. The salts of U and UO_2 cause oxidation of KI in the sun in a few minutes. The salts of Mn and Fe do not cause this pheno-

menon. The different salts act differently according to their fluorescence; only the fluorescent ones are photodynamically active. The salts of U, though photodynamically active, do not act on cells, probably because they are not absorbed. The solar light must be considered as a constant factor in the determination of the photodynamic phenomenon.—C. d. F.

775. Über die Natur der Lipochrome. C. Kreibich (*Arch. f. Derm. u. Syph.*, 1920, **127,** 762-6).—A description of the staining reactions and properties of the lipoid occurring in prostatic secretion, epithelium of seminal vesicles, cardiac muscle, adrenals, and sometimes in the corpus luteum.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

MUSCLE

776. The Regulation of the Supply of Energy in Muscular Contraction. W. Hartree and A. V. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxi).—The effect of temperature on the heat given out by a contracting muscle for stimuli of varying duration is discussed. The behaviour of contracting muscle from a theoretical standpoint is considered.—E. P.

777. Die Energieumwandlung im Muskel. III. Kohlenhydrat- und Milchsäureumsatz im Froschmuskel. O. Meyerhof (*Pflüger's Arch.*, 1920, **185,** 11-32; see Abstract No. 2859, Vol. V., p. 455).—The conclusions in the previous paper are confirmed, especially as regards the relation of carbohydrate to lactic acid under various conditions. The carbohydrate which varies most closely in relation to lactic acid formation is glycogen. Thus in fatigue, anaerobic survival, and injury, the glycogen loss and lactic acid gain are equivalent. During recovery the glycogen gain is equivalent to the total lactic acid loss minus the lactic acid oxidised away. The difference between the (large) oxygen consumption of injured muscle and that (small) of injured muscle in presence of HCN corresponds with the (0·02 to 0·03% per hour) greater rate of accumulation of lactic acid in the latter.—C. L. E.

778. Die Totenstarre und ihre Beziehung zur Kontraktion. Eine vergleichend-physiologische Betrachtung über die Nekrobiose der lebendigen Substanz. J. G. Schaefer (*Biol. Zentralbl.*, 1920, **40,** 316-34).—Rigor and normal muscular contraction are fundamentally similar, each being produced by the action of acid. But while the latter is reversible on removal of the acid products, the former merges into a coagulation process as a result of further action of the acid. All living matter contracts on being killed; the contracted state is its equilibrium condition. It is kept in expansion during life by its own active processes.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

779. Heat Paralysis in Plain Muscle. C. L. Evans (Proc. Physiol. Soc., *J. Physiol.*, 1921, **54,** cxxxix-cxl).—Plain muscle (*e.g.*, the guinea-pig uterus), when heated to a certain temperature (49°C.), fails to respond to drugs (histamine) which previously caused contraction; when recooled to normal temperature, the contractility is restored. This heat paralysis can be imitated by treating the tissue with CO_2 and lactic acid, on removal of which the excitability is restored. It is suggested that the heat paralysis is caused by an accumulation of metabolites, which are formed more rapidly than removed. It is therefore a relative oxygen lack in spite of a maximal oxygen consumption.—C. L. E.

780. Nuovo ricerche sui muscoli striati e lisci di animali omeotermi. XIII. Contrattura da freddo nei muscoli striati. F. Botazzi (*Rend. R. Acc. Lincei*, 1920, **29** [5*a*], 105-12; compare Abstract No. 777, Vol. V., p. 121).—Experiments were made on strips of dog's diaphragm, suspended between two golden hooks and plunged into Ringer's solution or fluid paraffin through which oxygen bubbled. The strips were progressively warmed or cooled, starting from room temperature. The influence of the

warming will be dealt with later. When the temperature reaches 0° C., the strip shows the slow shortening which the author has termed "cold contracture." This is frequently preceded by a slight increase in the tonus, which begins to appear at 10° C. If, after having reached −2° or −4° C., the fluid is again warmed back to 0° C., the contracture disappears. But if the temperature of −2° or −4° C. is kept constant, the contracture persists with slight oscillations. The phenomenon is therefore reversible, and the permanence of the contracture depends upon the persistence of the low temperature. During the cold shortening the preparation is unexcitable by ordinary stimuli, but after having been warmed it is again as excitable as before. The curve is the same whether the preparation is in Ringer's solution of double concentration or in liquid paraffin. The muscle strip freezes at −7° or −8° C., which may be taken to indicate that the interstitial fluid of striped muscles freezes at about the same temperature. The freezing is shown on the tracings by a sudden rising of the curve. The cold contracture appears to be a labile phenomenon; in fact, 2 or 3 hours after death in summer and 24 in winter it cannot be made to occur, even by very low temperatures, and though the preparations are still quite excitable. As shown by a special set of experiments, the cold contracture is independent of the innervation of the diaphragm. But the degenerated muscles remain contracted under the influence of cold for a longer time than normal ones, and they require a much longer period to regain their previous length at temperatures at which normal muscles have already returned to their original state. In other words, muscles degenerated in consequence of denervation appear to possess the tonic or postural function in a very high degree. The muscles of poikilothermal animals and the tendons of all animals do not show cold contracture even if cooled till they freeze (−8° C.).—C. d. F.

781. Histologie der glatten Musculatur in der Haut des Neugeborenen. E. Slawik (*Zeit. f. Kinderheilk.*, 1921, **27**, 153-60).—The skin of sucklings often shows a "shagreen" appearance, as the result of cold and tactile irritation; this is well seen in the thigh region. The author regards this as a vaso-motor reflex. Histologically the arrectores pilorum are normal.—H. W.

782. Über die Latenzzeit des Sartorius in Abhängigkeit von der Strömstärke bei Reizung mit konstantem Strom. W. Steinhausen (*Pflüger's Arch.*, 1921, **187**, 26-46).—Constancy of current was attained by using a high voltage with a large variable resistance (mannite, boric acid or electronic tube). The period of latency was determined by Pouillet's method with a falling key. The latent period for maximal induction shocks was 3·6 σ. For constant currents, the period varied according to strength of stimulus, being as much as 40 σ for stimuli near threshold value. When strength of current and latent period were plotted on co-ordinates, it was found that with diminishing strengths of current the latent periods were longer than with increasing currents; the curves were hyperbolas, and the various constants are discussed. The period of afterloading and the number of fibres stimulated are of importance in determining the latent period. In the theoretical discussion the question of the all-or-nothing law and other alternatives are discussed, and it is pointed out that Nernst's theory does not adequately explain the experimental results.—C. L. E.

783. L'action physiologique des acides et leur solubilité dans les lipoïdes. M. Philippson and G. Hannevart (*Compt. rend. soc. biol.*, 1920, **83**, 1570-2).—Organic acids at 0·01 *N* concentration have an inhibitory action on muscular contraction, the power of each acid depending on its position in the ascending series—formic, glyceric, lactic, tartaric, acetic, proprionic, malic, and butyric. The diffusibility of these acids through a collodion membrane charged with a lipoid follows a similar order. Inorganic acids behave oppositely on muscle, while the artificial lipoid membrane is impermeable to them.—R. K. S. L.

784. Physiologisches und pathologisches von Muskelton. K. Landauer (*Deutsch. med. Woch.*, 1920, **46,** 1416-8).—In hysteria and other nervous affections, contracture often occurs in muscles, during which there is no sign of increased metabolism or electrical change. The author relies on the old method of the muscle sound, but could hear none in such contracture.—W. D. H.

785. Zur Sarkoplasma Theorie der tonischen Erscheinungen am quergestreiften Muskel. S. Gutherz (*Berlin. klin. Woch.*, 1920, **57,** 1166-7).—A brief account is given of the history of the theory that sarcoplasm is responsible for muscle tonus. The author fails to see how a material present in such small amount in the muscle fibres can act in this way.—W. D. H.

786. Beiträge zur Frage der autonomen Innervation des Skelettmuskels. I. Über die Tiegelsche Contractur beim Menschen. H. Schäffer (*Pflüger's Arch.*, 1920, **185,** 42-69).—Tiegel's contracture (=contraction remainder) was studied in man by means of the ergograph. It is most persistent after direct excitation of the muscle either by faradic or galvanic currents, less after indirect excitation, and least after voluntary contraction. In some cases it is maximal—*i.e.*, the muscle has no relaxation following the contraction; it can often be easily obtained even with weak currents, when the stimulation is synchronous with a voluntary contraction; is inhibited by local anæmia; is accompanied by irregular action currents; and since it occurs after regional anæsthesia of the nerve plexus, is a purely peripheral affair. Drugs which stimulate the parasympathetic system (pilocarpine, physostigmine) enhance the contracture, while sympathetic stimulants (adrenaline) and parasympathetic paralysants (atropine, scopolamine) both reduce its intensity. The fundamental metabolic changes causing the effect are under the control of the autonomic nervous system, which control is effected by a functional antagonism between parasympathetic and sympathetic.—C. L. E.

787. Creatine and Muscle Tonus in Man. F. S. Hammett (*J. Amer. Med. Assoc.*, 1921, **76,** 502-3).—Determinations on the blood of a man in a state of catatonic stupor for 8 weeks showed increase of creatine during re-establishment of normal muscular tone. The observations support the view that creatine is a normal end-product of protein catabolism.—C. L. E.

788. Des différentes sources de courants électriques des systèmes musculaires. J. De Meyer (*Arch. intern. physiol.*, 1921, **16,** 44-57).—L'auteur démontre par l'examen d'un grand nombre de tracés publiés par les auteurs que, à côté des courants d'action mis en liberté par les contractions musculaires, il existe toute une série de variations électriques liées non aux contractions elles-mêmes, mais bien à des processus subséquents de changements de forme, de longueur et de tension.—L. F.

789. Sur les courants de déformation des muscles. J. De Meyer (*Arch. intern. physiol.*, 1921, **16,** 64-99).—Toute déformation passive du muscle fait naître, entre les points inégalement soumis à déformation, des différences de potentiel, donnant naissance à des *courants de déformation*, parmi lesquels il faut distinguer les *courants de raccourcissement, d'extension* et *de débente*. Ces courants diffèrent des courants d'action. Ils sont d'autant plus intenses que les électrodes sont disposées sur des endroits de déformabilité différente. Le potentiel négatif siège, lors de l'extension du côté le moins étiré, c.à.d. du côté du tendon. C'est l'inverse lors du raccourcissement. Ces courants n'ont pas de période latente quand ils sont maximaux, leur durée est égale à celle de la déformation et ils conservent la même force pour une même déformation. Cette force est proportionnelle à la grandeur de la déformation produite (n'obeit donc pas à la loi de Weber-Fechner). Ces courants de déformation peuvent donner naissance à de très légers courants dans les nerfs centripètes des muscles soumis à l'extension. Ces courants ne se moutrent plus sur des muscles chauffés à 43°. L'auteur insiste sur la pluralité d'origine des forces électromotrices des muscles. Il propose d'en faire

l'application dans l'explication des phases terminales de l'électro-cardiogrammes. —L. F.

790. Der Segelflug. J. von Uexküll (*Pflüger's Arch.*, 1921, **187,** 25).—The bird's body is regarded as a sail, the wings being held horizontal.—C. L. E.

NERVE. REFLEX ACTION

791. Nerve and Plasmodesma. H. V. Neal (*J. Comp. Neurol.*, 1921, **33,** No. 1).—Previous to the stage of 4·5 mm. there are no protoplasmic connections between neural tube and myotome in embryos of *Squalus acanthias*. Neurofibrillar substance is present in the first protoplasmic connections between neural tube and myotome. In these primary connections deeply staining neurofibrils may be traced to bipolar neuroblasts within the neural tube. The claim that the primary connections consist of undifferentiated plasmodesmata is based upon inadequate methods. In stages before protoplasmic connections between tube and myotome is effected certain medullary cells in zones where later the nerve anlagen make their appearance show in Bielchowsky-Paton preparations a deeply staining neuroreticulum. In slightly later stages when neuromuscular connection is established, similar cells are found connected with neurofibrillæ extending into the nerve anlagen in the manner characteristic of medullary neuroblasts stained by specific neurofibrillar stains. The evidence of the presence of similar neurofibrillar substance in all parts of the nerve anlagen supports the inference that the neuromuscular connections are established, not by different cells, but by medullary neuroblasts, as maintained by supporters of the Bidder-Kupffer theory. Indifferent cells participate in the formation of nerve anlagen only in more advanced stages by a process of migration from the neural tube.—W. D. H. (*W. I.*).

792. Nervenleitungsgeschwindekeit und Temperatur. P. Broemser (*Zeit. Biol.*, 1921, **73,** 19-28).—A number of observations are recorded on the rate of conduction in frogs' nerves. A factor in the effect of any temperature is the temperature at which the frog was kept previous to the observation, or the nerve was kept in Ringer's fluid. The author attempts to explain his results and to express them mathematically.—H. W.

793. La circolazione sanguigna dei nervi isolati. L. Torraca (*Chir. degli organi di mov.*, 1920, **4,** 279).—The sciatic nerve in dogs was isolated in its whole extent, denuded of epineural connective tissue, and protected from surrounding tissues by an india-rubber sheath. Merely transitory paralysis followed. Full power of movement returned. The intrinsic circulation of an isolated nerve is sufficient to preclude any danger of necrosis.—J. A. H. (*Med. Sci.*).

794. Intorno alla sistematizzazione fascicolare dei nervi periferici. G. C. Riquier (*Boll. d. Soc. med. chir. di Pavia*, 1920, **33,** 9).—Serial sections of human cubital nerve show that the fasciculi change in number and size according to the level of the section. They have fundamentally the same position along the nerve trunk. An irregular mixing of nerve bundles and fasciculi in the same nerve trunk is excluded.—J. A. H. (*Med. Sci.*).

795. Über sensible Fasern in der vorderen Wurzel. W. Lehmann (*Berlin. klin. Woch.*, 1920, **57,** 1218-9).—As the result of an investigation in a case of war injury, the author suggests that sensory fibres of sympathetic origin may enter the cord by the anterior roots. He admits that further research is necessary.—W. D. H.

796. The Sacral Sympathetic Trunk of the Cat. S. E. Johnson (*J. Comp. Neurol.*, 1921, **33,** No. 1).—This is not connected with the spinal nerves by white rami communicantes, and therefore receives no preganglionic efferent fibres except those which descend in the trunk from a higher level (Langley). In this respect the sacral trunk possesses an advantage in searching for commissural elements. An intercellular plexus of nerve

fibres in the ganglia of the trunk has been described by several writers (Ranson and Billingsley). This plexus consists of the processes of sympathetic cells in the trunk ganglia and of finer, more darkly staining ramifications which, in the superior cervical ganglion, Ranson and Billingsley have shown to be derived from preganglionic efferent fibres. The fine ramifications of these fibres in the sacral ganglia can be eliminated on dividing the trunk caudad to the lowest white ramus and giving sufficient time for their degeneration. The sympathetic trunks were cut between the seventh lumbar and first sacral ganglia, and 30 days allowed for degeneration. In the sacral ganglia of animals so operated on there could not be found any of the fine, darkly staining ramifications seen in normal ganglia. No fibres suggestive of commissural connections could be found. A few medullated fibres of various sizes were found to reach the trunk by way of the grey rami. These degenerated upon section of the dorsal nerve roots distal to the spinal ganglia.—W. D. H. (*W. I.*).

797. Action of Bile on the Excitability of the Spinal Reflex Centres. A. Rossi (*Arch. sci. med.*, 1920, **43**, 156-66; compare Abstract No. 3071, Vol. V., p. 488).—In a frog, bile caused a more rapid diminution than in a control treated with normal saline, the amount of reduction being proportional to the amount of bile. An effect is produced by amounts of bile insufficient to affect the motor nerves or the muscle (gastrocnemius) itself.—W. D. H. (*Chem. Abstr.*).

798. Visceral Sensory Nervous System. V. Cardiac and Vaso-motor Reflexes induced by Visceral Stimulation in Amphibia and Reptilia. A. J. Carlson and A. B. Luckhardt (*Amer. J. Physiol.*, 1921, **55**, 31-52).—In the frog, stimulation of the lungs, gastro-intestinal or urino-genital tracts causes reflex cardiac inhibition, absent when the vagus is paralysed by curare. In the latter case, there is acceleration. In the salamander, the ovarian and intestinal mesentery and the skin are to be added. In the turtle, reflex cardiac acceleration and rise in blood-pressure are obtained from the pulmonary and gastric vagi. Stimulation of the large or small intestine, bladder, or cloaca gives cardiac inhibition; under curare, reflex acceleration. The spontaneous contractions of the empty stomach do not, as a rule, produce cardiac or vaso-motor reflexes. The central end of the sympathetic causes acceleration of the heart. Visual stimulation may be inhibitory. The discharge of the respiratory centre may spread to the cardiac inhibitory or accelerator centres. The cardiac vagus is in tonic activity.—W. M. B.

799. Visceral Sensory Nervous System. IV. The Action of Certain Drugs on the Lung Motor Mechanisms of the Reptilia (Turtle, Snake). A. B. Luckhardt and A. J. Carlson (*Amer. J. Physiol.*, 1921, **55**, 13-30).—Curare depresses this mechanism by central action. Picrotoxin stimulates the centre, accelerating the rhythm through the vagus. Nicotine causes central inhibition; in large doses, contraction of the lung, presumably by direct action on the muscle. The peripheral nerve endings of the lung vagus are only paralysed if the dose is large enough to act as a general protoplasmic poison. Histamine causes direct muscular contraction, and has a slight inhibitory action on the centre. Atropine in small doses paralyses the motor endings. Adrenaline weakens by acting on the respiratory and lung-motor centres. If the lung is in a state of tonus, adrenaline causes a primary inhibition. It has no effect on the tetanus caused by nicotine or histamine.—W. M. B.

CENTRAL NERVOUS SYSTEM

800. Contribution à l'étude du métabolisme cérébral par la méthode des circulations partielles. 3me partie: Recherches sur la nature des matériaux sécrétés par le foie nécessaires au travail des centres nerveux. H. Renauld-Capart (*Arch. intern. physiol.*, 1921, **16**, 21-43).—L'auteur a établi précédemment que l'exclusion du foie de la circula-

tion générale entraîne la suppression des fonctions du système nerveux central et la mort rapide de l'animal. Le foie verse par sécrétion interne dans la circulation une substance de nature inconnue, nécessaire au travail des centres nerveux. Cette substance contenue dans la partie liquide du sang et non dans les globules, est détruite par une température de 57° à 60°. Elle n'est pas spécifique: le sérum de bœuf injecté au chien à foie exclu de la circulation, ranime l'excitabilité de son système nerveux, comme le ferait du sérum de chien. La substance agit à très petite dose; c'est plutôt un corps excito-secréteur, par ex. un ferment, ou une substance catalysatrice plutôt qu'une substance nutritive ou même une hormone.—L. F.

801. Inhibition et volonté. G. Fano (*Revue générale des sciences*, October 30, 1920; reprint, pp. 26).—The brain of the tortoise can be differentiated antero-posteriorly into 4 segments—cerebral hemispheres, thalamus, optic lobes, medulla. Ablation of whole brain less medulla produces continuous or periodic movement from stimuli arising in medullary centres: of intermediate and anterior brains, absolute immobility (save for external stimulation); of cerebral hemispheres alone, no effect on movement, but animal appears stupid. Certain facts are submitted in relation to the control of brain over the spinal centres of the limbs, and the probable parts played by the cerebral hemispheres and the thalamus in the origin of voluntary movement. The result of the ablation experiments is to indicate that a voluntary act results from inhibition exercised by the cerebral hemispheres and the thalamus on the inhibition which the optic lobes in turn exercise on the medulla, and impulses from the automatic centres there are then conveyed along the appropriate paths for the movement desired.—M. L. W.

802. The Relative Heights of the Eating and Drinking Arcs in the Pigeon's Brain, and Brain Evolution. A. O. Shaklee (*Amer. J. Physiol.*, 1921, **55**, 65-83).—After removal of cerebral hemispheres (including corpus striatum, but leaving thalamus), sight-drinking is still possible. But the complete mechanism requires cerebrum. Removal as above breaks the chain of reaction essential to eating by removing centres for seizing food with the beak and propelling it along the beak. The taste centre and the centre for hunger-flying probably lie in the cerebrum. There are centres for hunger-walking, grain-sight-pecking, ground-scratching, and some related activities in the subcerebral brain. There are also inhibitory mechanisms in it. The decerebrate pigeon does not react in the same way invariably to the same stimuli. It is not indifferent to surroundings. These reactions are fully developed for many months after ablation, but there is no reason to infer that there is a " taking-over " of cerebral functions. Subcerebral arcs gradually become patent after loss of permeability from disuse owing to production of more patent arcs in the cerebrum acting as shunts.—W. M. B.

803. Der Aufbau des Ernahrungssystems der nervösen Zentralorgane. F. Groebbels (*Münch. med. Woch.*, 1920, **67**, 923-6).—By special staining, the author has investigated the relationships within the C.N.S. of glia, ganglion cells, and vessels. The methods consist first of the precipitation of chlorides as silver chloride. Sections are then cut and stained with methylene blue. Nuclei, dendrites, and Nissl bodies are stained blue, while vessels, lymphatics, and " glia reticulum " are yellowish-brown. The deductions, if confirmed, are far-reaching.—J. H. B.

804. Die Assoziationssysteme des menschlichen Vorderhirns. N. v. Mayendorf (*Archiv f.* [*Anat. u.*] *Physiol.*, 1919, 283-390).—Anatomical.—C. L. E.

SENSE ORGANS

805. Unequal Iris Pigmentation due to Lesions of the Sympathetic Nerve. P. J. Waardenburg (*Nederlandsch Tijdschr. v. Geneesk.*, 1920, **64,** 1929-41).—The inequality of iris pigmentation is due to lesions of the sympathetic, and is probably bound up with changes in the muscular movements of the pupil.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

806. I. Tension artérielle rétinienne. C. Duverger and F. A. Barré (*Arch. d'ophthalmol.*, 1920, **36,** 71-87). **II. Quelques mensurations de la tension artérielle rétinienne.** E. Velter (*ibid.*, 88-94).—I. The arterial pressure in the retinal vessels is equal to and subject to the same changes as the general arterial pressure. The retinal arterial and intraocular pressures are completely independent of each other. II. The errors in Bailliart's method for measuring retinal arterial pressures are pointed out, and the results arrived at by Duverger and Barré are confirmed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

807. Entoptische Versuche über Netzhautdurchblutung. U. Ebbecke (*Pflüger's Arch.*, 1921, **186,** 220-37).—The blood-supply of the eyeball can be reduced by application of pressure to it; the effects of this on the Purkinje figures, phosphenes, etc. are described. As after-effects the sensation of purple and flashes of light are due to the anæmia produced. Peripheral retinal fields are less vascular than central ones. The retina is very slightly sensible to pressure, but very sensitive to alterations of blood-supply.—C. L. E.

808. Eye Lesions produced by Light Rich in Ultra-violet Rays. Senile Cataract, Senile Degeneration of Macula. J. van der Hoeve (*Amer. J. Ophthal.*, 1920, **3,** 178-94).—Ultra-violet light leads chiefly to the production of cataract: the lens is protected by its optical heterogeneity and its fluorescence. But such rays as escape the lens may damage the ciliary processes or the retina.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

809. Der farbenblinde und schwachsichtige Saum des blinden Flecks. U. Ebbecke (*Pflüger's Arch.*, 1920, **185,** 173-80).—The demonstration of these 2 properties of the margin of the papilla by simple experiments is described; the periphery of the retina has similar properties. From a general consideration of the facts of colour-blind vision it is concluded that more neurons are intercalated in coloured than in light and shade vision.—C. L. E.

810. Über das Augenblicksehen. Über das Sehen im Flimmerlicht. U. Ebbecke (*Pflüger's Arch.*, 1920, **185,** 181-95, 196-223).—(1) Vision by momentary illumination differs from ordinary vision in the greater luminosity and poorer colour saturation, the preponderance of irradiation and simultaneous contrast, and the speed of adaptation. Certain entoptic phenomena are also prominent. (2) Vision in flickering light is periodic momentary vision with a relatively dark-adapted eye. The details of the papers are not adapted for abstraction.—C. L. E.

811. Über zentrale Hemmung und die Wechselwirkung der Sehfeldstellen. U. Ebbecke (*Pflüger's Arch.*, 1921, **186,** 200-19).—Inhibition, rebound, and modification of inhibition are common properties seen in nervous centres, and in psycho-physical phenomena such as sleep and attention. The theory of central inhibition and reciprocal innervation is applicable to visual stimuli, as in various contrast and after-image phenomena, and leads to an extension of the complementary colour theory in which the "visual substance" is represented by neurons. The consequences of this as regards the sensation of black and the nervous mechanism of adaptation are discussed.—C. L. E.

812. Die Rotgrünblindheiten. C. v. Hess (*Pflüger's Arch.*, 1920, **185,** 147-64).—Quantitative methods of investigation are described. Red-blinds are intermediate between green-blinds and those totally colour-blind in being relatively insensitive also to blue and yellow. Various other points are discussed.—C. L. E.

813. On Head Nystagmus in the Pigeon. D. Ogata (*Mitt. der med. fak. Univ.*, Kyushu, 1917, **4,** 35-42).—The head nystagmus observed in pigeons when rotated on a disc is partly of optical and partly of labyrinthine origin. The nystagmus continues for some time after the rotation is stopped; this after-nystagmus is a purely labyrinthine reaction. A graphic method used for these experiments is described.—G. V. A.

814. On Ewald's Theory relating to the Ampullofugal and Ampullopetal Endolymph Currents. A. Rejtö (*J. Laryngol., Rhinol., and Otol.*, 1920, **35,** 176-81).—In opposition to Ewald, the author finds that ampullofugal movement of the endolymph in the horizontal semicircular canal leads to increase, and ampullopetal movement to a decrease of the tone of labyrinthine origin in, *e.g.*, the extrinsic eye muscles.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

815. Experimenteller Nachweis der Endolymphbewegung im Bogengangsapparat des Ohrlabyrinthes bei adäquater und kalorischer Reizung. M. Maier and H. Lion (*Pflüger's Arch.*, 1921, **187,** 47-74).—The movement of fluid in bent glass capillaries of various diameters, when these were rotated or when one limb was warmed or cooled, was studied. Similar observations were also made on the movement of fluid in the semicircular canals of the pigeon and cod, a small segment of membranous labyrinth being laid bare for the purpose. In order to render the movement of fluid evident, a dilute suspension of red corpuscles was added to the contents under observation (under low power microscope). Definite movement was observed both on rotation and on caloric stimulation. Most of the conditions of movement are obvious deductions in elementary hydrostatics—*e.g.*, that the movement is greater at centre than at periphery of the stream; that the velocity on caloric stimulation is greater the greater the temperature difference between cool and warm ends of canal, and independent, within limits, of duration of temperature change, etc. The observation that on caloric stimulation the movement only slowly reaches a maximum and slowly dies away, whereas on rotation the movement is much more sudden and ceases more abruptly, is also what might be expected.—C. L. E.

816. Sulla funzione dei canali semicircolari—IV. P. Tullio (*Arch. di Fisiol.*, 1919, **17,** 177-232).—Continuing his studies on the semicircular canals (Abstracts No. 97, 1918, Vol. III., p. 21, and No. 64, 1919, Vol. IV., p. 12), the author has investigated the relations between the labyrinth and movements of the eyeballs. Experiments were made on various mammals and birds either by simply producing a more or less prolonged, but in every case definite, sound within the ear of the healthy animals, or by repeating the same experiments on animals (pigeons) in which one or other of the semicircular canals had been previously injured. In the first set of experiments a series of movements occurred of both eyeballs, of head and limbs, of the external ear, eyelids, and pupils, even when the animals were in a state of complete narcosis. In the second set of experiments the following phenomena were observed: Any lesion of the canals markedly increases the sensitiveness of the animal to the sound—*i.e.*, the movements caused were quicker and of a wider sweep. The head moves round an axis perpendicular to the plane in which the injured semicircular canals are situated, and always in a certain direction —*e.g.*, after the lesion of the lateral canals, the head moves towards the opposite side; of the posterior canals, the head moves downwards; of the superior canals, the head moves upwards. After the bilateral lesion of corresponding canals the movement due to the stimulation of one ear represents the mirror image of that obtainable by stimulating the other ear. The general conclusion arrived at is this: Sound, as it strikes the labyrinth, causes currents in the endolymph, which change in direction and intensity according to the direction of the sound itself. These currents, by bending the acoustic crests, cause the visual axis to move towards the direction of the sound. —C. d. F.

817. Physiologisch-akustische Untersuchungen. I. Zur Frage der Entstehung zentraler Schwebungen. A. Kreidl and S. Gatscher (*Pflüger's Arch.*, 1920, **185,** 165-72).—Theoretical.—C. L. E.

818. Are the Taste Buds of Elasmobranchs Endodermal? M. H. Cook and H. V. Neal (*J. Comp. Neurol.*, 1921, **33,** No. 1).—Taste buds in this species are limited to the pharynx, which in all stages of ontogenesis is lined with endoderm. No marked encroachment of the ectoderm is perceptible even in the mouth region. Scales similar to those which characterise the outer skin arise in late stages of ontogenesis. Thus two kinds of organs usually classed as ectodermal—viz., taste buds and placoid scales—appear to arise from the endoderm of the pharynx of *Squalus acanthias*. To assert that the pharyngeal taste buds and scales of Squalus are ectodermal would necessitate the assumption that the endodermic lining of the pharynx completely disappears during ontogeny, and is replaced by ectoderm. Evidence of such substitution is wholly lacking.—W. D. H. (*W. I.*).

819. Zur Theorie des Geruchssinns. I. Parosmiestudien. F. B. Hofmann (*Zeit. Biol.*, 1921, **73,** 29-66).—The observations were made on the author himself who suffered from almost total loss of smell, with restoration later. In the time of restoration qualitative changes of the sense were observed. The enumeration results with many odoriferous material are given in great detail. Some substances had a different smell to a normal man. These were not constant, but changed with the progress of restoration. The conclusion is drawn that not only one peripheral sense apparatus is irritated by most odoriferous substances, but a series of such apparatus, each with different specific energy. By the combined action of a series of such receptive organs, combined odour sensations occur. The fusion of the constituents occurs in varying degree. This explains why some odoriferous substances smell differently with high and low concentration, and also accounts for the similarity of odour of many chemically pure substances.—H. W.

820. El espacio tactil. R. Turró (*Arch. de neurobiol.*, 1920, **1,** 2-16).—An essay on the nature and development of the sense of touch taken from an as yet unpublished work on the subject.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

821. Von der stichartigen Mitempfindung. B. Mittelmann (*Pflüger's Arch.*, 1920, **185,** 93-110).—In most persons pain and cold terminals may be found which give punctiform sympathetic sensations (pain or cold) at other points, followed in the case of the pain sensations by an itching. Both primary and secondary points occur only in the spinal segments, and are homolateral. The third dorsal segment is a transition zone; primary points above it have secondary points lower down, and *vice versa*. Primary sympathetic points probably occur also in the alimentary canal or peritoneum. The effect is due to a particular one-sided spread of the excitation from the path of the primary to that of the secondary point. Its punctiform character indicates a punctiform extent of pain receptors.—C. L. E.

822. Sensory Impulses from Bladder. G. Riddoch (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxxiv-v).—A summary of the evidence is presented to show that the inferior hypogastric nerves conduct the impulses from the bladder to the spinal cord. The evidence is derived from cases of war injury.—W. D. H.

PSYCHOLOGY

823. Instinct and the Unconscious. W. H. R. Rivers (*Cambridge Medical Series*, University Press, Cambridge, 1920).—The question of psycho-pathology is approached from the biological and neuro-physiological side. The view is emphasised that the hall mark of the instinctive reaction is that it shows in its primitive form the all-or-none principle. With growth of intelligence the purity of the all-or-none principle is no longer

found; the reaction has become modified. The author attempts to show that hysteria may be regarded as a modified instance of the reaction of immobility. A distinction is drawn between the idea of dissociation and that of suppression. Dissociated ideas have a consciousness alternating with that of the ordinary personality. Suppressed ideas have no consciousness. The insistence of the author that suppression is a normal and frequently salutary process is perhaps of some importance to clinicians.—J. A. H. (*Med. Sci.*).

824. Mental Tests. W. A. Potts (*Lancet*, 1921, i., 478-81).—The passing of the Mental Deficiency Act of 1913 renders necessary the application of trustworthy tests. Some of the more important of those proposed are described and discussed.—W. D. H.

825. Coloured Thinking. F. H. Perrycoste (*Nature*, 1921, **106**, 829-30).—Further examples (see Abstract No. 207, Vol. VI., p. 31).—C. L. E.

826. Effect of Antipyretics on the Behaviour of Rats in the Circular Maze. D. I Macht and W. Bloom (*J. Pharm. Expt. Ther.*, 1921, **17**, 21-40).—Albino rats 60-90 days old were taught to find their way to the centre of a circular maze, and the effects of the drugs as regards their influence on memory and general behaviour were studied. Of the antipyretics tested, antipyrine and pyramidon produced the greatest depression. (Acetanilide and phenacetin came next in order of producing depression. Salicylates were but slightly depressant, if at all, and quinine was mildly depressant after large doses.) Combinations of various antipyretics produced less depression than the individual components given above. In all cases, even after very large doses of the drugs, the animals eventually regained their normal activity.—E. M.

827. Effects of Ethanol, Caffeine, and Nicotine on Behaviour. D. I. Macht and W. Bloom (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 99-100).—The effects of the drugs were studied on albino rats in a circular maze. When given in sufficient quantity, all produced depression, as manifested by slower movements, inco-ordination, and number of errors committed, etc.—D. H. de S.

828. The Effect of Prostatectomy on the Behaviour and Learning of Albino Rats. D. I. Macht and W. Bloom (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 100-1; *J. Urol.*, 1921, **5**, 29-42).—Extirpation of the prostate exerted no influence.—D. H. de S.

829. Etude sur le phénomène psycho-galvanique chez la grenouille. A. Fauville (*Arch. intern. physiol.*, 1921, **16**, 58-63).—Le réflexe psycho-galvanique (diminution de résistance électrique et différence de potentiel dans les pattes postérieures de la grenouille sous l'influence d'une excitation consistant en un choc d'induction appliqué à une patte antérieure) est chez la grenouille un phénomène cutane causé par une augmentation passagère de l'activité des glandes sudoripares; l'atropine qui supprime l'action de ces glandes, fait disparaître le reflexe; la pilocarpine portant leur activité au maximum, donne le même résultat.—L. F.

CEREBRO-SPINAL FLUID

830. Über die Zerebrospinalflüssigkeit. O. Fleischmann (*Berlin. klin. Woch.*, 1921, **58**, 60-1).—The author regards the formation of the fluid as a filtration from the blood. The plexus cells absorb again most of its constituents. Failure of reabsorptive power, when the choroid plexus is diseased, leads to the retention of these blood constituents in the fluid; they are harmful to the nerve cells.—W. D. H.

831. Test for Changes in the Protein Content of the Cerebro-spinal Fluid based on the Flocculation of Lipoids. H. Noguchi (*J. Amer. Med. Assoc.*, 1921, **76**, 632-3).—The reagent is made by mixing an alcoholic solution of the acetone-insoluble lipoids of ox heart with a solution of acetic and picric acids, acid potassium phosphate, and

sodium chloride. When 1 c.c. of this reagent is added to 0·1 c.c. of the C.S.F., a dense precipitate is formed in a few minutes if there is excess of protein—*e.g.*, in bacterial meningitis, tabes, or G.P.I. The results run parallel with those of the butyric acid reaction, and the method can be made quantitative.—C. L. E.

832. L'alcool dans le liquide céphalo-rachidien. (7) Nouveaux dosages 24 heures après la fin de l'ingestion. (8) Recherche de la réaction de l'alcool chez les sujets soumis à l'action du chloral et du chloroforme. E. Lenoble, P. Le Gloahec, P. Baumier, and I. Cann (*Bull. et mém. de la soc. méd. des hôp. de Paris*, 1920, **36,** 465-70).—(7) The disappearance of alcohol from the cerebro-spinal fluid is delayed in heavy drinkers. (8) Only in excessive doses does chloral give rise to traces of alcohol in the cerebro-spinal fluid; production of formic acid was never observed. Chloroform, even in dangerous doses, does not call forth the production of alcohol.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

BLOOD

833. Constancy of the Volume of Blood-Plasma. A. V. Bock (*Arch. int. Med.*, 1921, **27,** 83-101).—In a variety of diseases (including œdema) the blood-plasma remains remarkably constant. Variations in total blood-volume are due to the corpuscles. The vital-red method was used. The CO method was found less satisfactory. The value in health and disease is that the plasma is 5% of the body-weight.—W. D. H.

834. Blood-Volume in Pernicious Anæmia. G. P. Denny (*Arch. int. Med.*, 1921, **27,** 38-47).—This was calculated by the CO method in 10 cases; the volume was reduced in all but one case, and so the findings differ from those of Lorrain Smith; the decrease is due to loss of cells; the one case where the total volume was normal, the plasma-volume was increased.—W. D. H.

835. Report on Five Thousand Bloods Typed, using Moss's Grouping. W. L. Culpepper (*J. Lab. and Clin. Med.*, 1921, **6,** 276-83).—Without exception, the five thousand sera could be grouped and classified according to Moss. There is a probability that types may overlap. A reaction in the recipient of blood from a donor of the same type may be explained by this overlapping. Hæmolysis is not specific for any one group. The reaction works best at about 40° C., and is not impaired by cold or by heat until coagulation takes place. Positive Wassermann sera do not influence the typing reaction.—D. H. de S.

836. Transfusion of Citrated Blood. M. H. Hoffman and H. C. Habein (*J. Amer. Med. Assoc.*, 1921, **76,** 358-60).—Description of an apparatus, with method of use.—C. L. E.

837. Die Senkungsgeschwindigkeit der roten Blutkörperchen in ihrer Beziehung zu Cholesterin und Lecithin. H. Kürten (*Pflüger's Arch.*, 1920, **185,** 248-61).—Cholesterol hastens, while lecithin retards sedimentation; hence the rate of sedimentation depends on the balance between the two substances in the plasma. The site of the effect is at the cell boundary.—C. L. E.

838. Untersuchungen über die Senkungsgeschwindigkeit der roten Blutkörperchen—II. G. Linzenmeier (*Pflüger's Arch.*, 1921, **186,** 272-89).—As in the blood in pregnancy (Abstract 2551, Vol. V., p. 404), so in various animals, sedimentation is retarded by shaking the plasma with kaolin or by warming to 56°, and hastened by gelatin or gum. The sedimentation (due to removal of a negative charge) of corpuscles is also hastened by fibrinogen, histone, and protamine, but not by albumin, nuclein, sodium nucleinate, or peptone. The sedimenting factor in blood is probably not fibrinogen, but a definite globulin fraction. The bloods of different species show individual peculiarities in sedimentation, which seems to be related, not only to alteration of electric charge, but also to adsorption of the agglutinating substances on the surface of the corpuscles.—C. L. E.

839. Untersuchung über Agglutination und Sedimentatierung von Bakterien. J. Vorschütz (*Pflüger's Arch.*, 1921, **186**, 290-8).—Certain bacteria are agglutinated by the serum of pregnant women under the same conditions as are the red corpuscles (Abstract No. 2551, Vol. V, p. 404).—C. L. E.

840. Quantitative Distribution of Particulate Material (Manganese Dioxide) administered Intravenously to the Cat. C. K. Drinker and L. A. Shaw (*J. Exp. Med.*, 1921, **33**, 77-98).—When 4 to 10 mg. of MnO_2 is given intravenously in acacia-NaCl solution, it is found that 1 hour later 47 can be recovered from the lungs, 38·3 from the liver, and 4·3% from the spleen. It is suggested that the vascular endothelium in these organs has phagocytic properties.—C. L. E.

841. Quantitative Distribution of Particulate Material (Manganese Dioxide) administered Intravenously to the Dog, Rabbit, Guinea-pig, Rat, Chicken, and Turtle. C. C. Lund, L. A. Shaw, and C. K. Drinker (*J. Exp. Med.*, 1921, **33**, 231-8).—One hour after injection in all animals except the cat the particles are chiefly collected in the liver. In the cat the material is at first equally divided between lungs and liver, but after 12 hours that from the lungs has been transferred to the liver. The results resemble those with bacterial suspensions.—C. L. E.

842. Etude de quelques réactions leucocytaires consécutives aux injections intraveineuses. H. Grenet, H. Drouin, and M. Caillard (*Compt. rend.*, 1921, **172**, 553-6).—Intravenous injection of a solution of chloride of sodium or other salt leads to an immediate leucocytosis. Injection of a colloidal solution (colloidal silver, etc.) produces first a leucopenia (hæmoclasic shock), followed 24 hours later by leucocytosis. The leucopenia is ascribed to the physical property of the latter injection, the leucocytosis to its chemical nature.—J. A. M.

843. La fonction antixénique des plaquettes sanguines. P. Govaerts (*Arch. intern. physiol.*, 1921, **16**, 1-20).—Les plaquettes sanguines s'accolent aux corps étrangers qui pénétrent dans le sang, les englobent dans les amas qu'elles forment en s'agglutinant entre elles, et les fixent dans les capillaires. Cette propriété se manifeste à l'égard des microbes qui sont la plupart englobés, retenus dans les capillaires, puis phagocytés; elle s'exerce aussi à l'égard des globules rouges étrangers et des particules minérales. On peut donc attribuer aux plaquettes une fonction antixénique générale qui contribue à empêcher l'envahissement du sang par des particules étrangères.—L. F.

844. Studies in the Properties of Blood-Platelets. A New Method for Counting Platelets. T. E. Buckman and J. E. Hallisey (*J. Amer. Med. Assoc.*, 1921, **76**, 427-9).—Blood drawn into a paraffined tube from a vein is diluted 200 times and shaken for 3 minutes with a fluid made as follows: To a filtered solution of 6% glucose and 0·4% sodium citrate are added 0·02% of neutral red, and when dissolved 0·1% crystal violet, and the solution heated to 60° for 5 minutes. It is then cooled slowly, centrifuged for 10 minutes, and finally twice filtered; 0·2% of formalin preserves the fluid indefinitely. Red counts are made after 3 minutes', white counts after 5 minutes', and platelet counts after 20 minutes' settling of the blood dilution in the counting chamber.—C. L. E.

845. Über die Beeinflussbarkeit der Blutgerinnung durch thromboplastischwirkende Substanzen. A. Szenes (*Mitt. a. d. Grenzgeb. der Med. u. Chir.*, 1920, **32**, 627-52).—Intravenous injections of hypertonic NaCl solutions (10%) cause in small doses (5 c.c.) an initial inhibition of coagulation, followed in some cases also by an acceleration. The combined injection of the press-fluid of organs (subcutaneous) and the 10% NaCl solution effects a further decrease of the coagulation time. Ca gelatin causes in nearly all cases with intramuscular injections an initial inhibition of the coagulation, followed by an acceleration. Intravenous Ca injections mostly cause, even after a few minutes, acceleration of the coagulation, which lasts hours or even days. An initial inhibition of coagulation was observed with minute doses.—H. W.

846. The Chlorine-Ion Concentration of Plasma, of Oxidised and Reduced Blood. W. E. L. Brown and A. V. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxi).—It was found that the difference of the Cl-ion concentration in the plasma of oxidised and of reduced blood was too small to be measured even by a delicate electrometric method. —E. P.

847. The Potassium Content of Human Blood. V. C. Myers and J. J. Short (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 72-3).—Normal human serum contains somewhat less than 20 mg. of K per 100 c.c.; whole blood contains about 8 to 10 times this amount. In cases of nitrogen retention the K content both of the serum and of the whole blood is increased. In general, the K content of whole blood tends to vary directly with the red cell content and the percentage of total solids.—D. H. de S.

848. Eine neue quantitative Bestimmungsmethode von Bilirubin im Blutserum. G. Haselhorst (*Münch. med. Woch.*, 1921, **68,** 174-7).—A colorimetric method of estimating the bilirubin content of 5 c.c. of venous blood. After separation of the corpuscles, the serum proteins are precipitated with alcohol. Bilirubin present then gives a violet-red coloration with Ehrlich's diazo reagent. This may be compared with a Bordeaux red standard.—J. H. B.

849. Estimation of Uric Acid in Blood. I. A. Zaleski and (Miss) A. A. Sachnovska (*Russ. Physiol. J.*, 1919, **2,** 14-35).—Experiments were made to test the accuracy of Folin's method, which depends on comparison of the intensities of the blue colorations obtained when the solution is treated with phosphotungstic acid in presence of alkali. The authors suggest modifications. The magnesium-silver salt, in which the uric acid is separated from the blood, is best decomposed, not by H_2S, but by HCl, the silver chloride being then removed by filtration; this shortens the time required. For determining the intensity of the blue, use is made of blue glasses previously standardised. The method admits of the estimation of the amount of uric acid in 10 c.c. of blood with an error of at most 0·05 m. gram.—W. D. H. (*J. C. Soc.*).

850. The Transfer of the So-called Normal Antibodies from Mother to Offspring. G. C. Reymann (*J. Immunol.*, 1920, **5,** 227).—An attempt to determine whether normal agglutinins and hæmagglutinins are transmitted to offspring. In the serum of only 1 out of 14 goats were agglutinins found at birth, though present in maternal sera. Agglutinins appear later on, derived possibly from maternal milk, and may be found 11 hours after birth. Injections of horse erythrocytes into kids increases the agglutinins for such erythrocytes and also for *B. coli*, and *vice versa* the injection of *B. coli* evokes agglutinin production not only for the homologous bacillus, but also for the red corpuscles of the horse.—J. A. H. (*Med. Sci.*).

851. Sobre la presencia de anticuerpos normales en la sangre. A. Sordelli (*Rev. del Inst. Bacteriol. del Dep. Nac. de Higiene*, 1920, **11,** No. 5).—The distribution of normal antibodies in the blood follows a certain law—viz., they run parallel to age.—B. A. H.

852. Klimatologische Studien. I. Der wirksame Anteil des Höhenklimas. O. Kestner (*Zeit. Biol.*, 1921, **73,** 1-6).—Dogs were made anæmic by bleeding or pyrodin (0·02 g. per kg. subcutaneous injection in aqueous solutions). The diminution and the subsequent increase of the blood-corpuscles were determined. Animals were investigated, partly living in the open air, partly under decreased air-pressure, and partly irradiated with the artificial light (arc lamp). The author considers that the effective factor of high climate is not in the diminished O_2 content, but the increased and more intense irradiation by the sun's rays. By the effect of the rays, substances are formed in the air which stimulate the formation of the red corpuscles if they are inhaled. It is possible that these unknown substances are nitoxyl compounds. If the irradiated air is conducted through a solution of KI starch (in the dark), an intense blue colour appears.—H. W.

853. Studii sull' azione della glicerina—III. J. Simon (*Arch. di Sci. Biol.*, 1920, **1,** 225-32).—The addition *in vitro* of glycerol to blood-serum increases its density, viscosity, and cryoscopic index, but it lowers its specific electric conductivity. The same facts can be observed in the blood-serum of animals in which glycerol was injected intravenously.—C. d. F.

HEART

854. Über die Bedeutung des Kaliums für die Selbststeuerung des Herzens. R. Kolm and E. P. Pick (*Pflüger's Arch.*, 1920, **185,** 235-47).—The initiation of automatic impulses in the frog's sinus and auricle is facilitated by KCl. $CaCl_2$ causes diastolic arrest of hearts perfused free of K, the systolic contracture being dependent on the simultaneous presence of K. KCl in doses which are non-toxic for the whole heart causes paralysis of the tertiary centres in the automatically beating ventricle; it can also inhibit the excitation of the automatic ventricle centres induced by Ca or Ba chlorides. The property possessed by K of resolving the contracture of hearts treated with Ca depends on the reinforcement of the impulses from sinus and auricle. The presence of K salts reduces the tendency of the ventricle to fibrillation. The K content of the blood and heart tissue is of importance in the maintenance of cardiac rhythm.—C. L. E.

855. Über die Beziehungen zwischen Herzmittel- und physiologischer Kationenwirkung. IV. Über Nichtelektrolytwirkung aufs Herz. V. Über die Wirkung von Lipoiden auf die Hypodynamie und deren Beziehung zum Kalium. O. Loewi (*Pflüger's Arch.*, 1921, **187,** 105-22, 123-31).—IV. Frogs' hearts poisoned with oxalate recover in isotonic non-electrolyte solutions (mannite) and in Ca-free NaCl with addition of non-electrolytes. The beat in Ca-free or low Ca solutions is improved by non-electrolytes. Isotonic non-electrolyte solutions cause contracture, which is increased by a normal Ca content, and further increased by KCl; but KCl without previous addition of Ca causes relaxation. Narcotics have the same effects as capillar-inactive non-electrolytes. It is concluded that non-electrolytes, like digitalis, make the heart more sensitive to Ca. V. Previous treatment of frog hearts with 0·01% lecithin or sodium oleate renders them relatively immune to choline and pilocarpine, even after prolonged washing. The effects of choline and pilocarpine can also be revoked by after-treatment with the same reagents. The same applies to potassium poisoning. Hypodynamic effects of various drugs are often due to K action.—C. L. E.

856. Berichtigung zu meiner Arbeit. Beitrag zur Physiologie des venösen Vorherzens (Sinus und Hohlvenen) der Ringelnatter. E. Kupelwieser (*Pflüger's Arch.*, 1921, **187,** 162-4).—Curves to illustrate former paper (Abstract No. 3418, Vol. V., p. 543).—C. L. E.

857. Über die Koeffizienten der Reizbildung im Herzen. H. E. Hering (*Pflüger's Arch.*, 1921, **187,** 132-5).—An objection to Mansfeld and Szent-Györgyi's paper (Abstract No. 3437, Vol. V., p. 546) on the ground that CO_2 can at most be only one condition for the origination of the heart-beat.—C. L. E.

858. Rapid Re-excitation in the Mammalian Auricle. A. N. Drury and T. Lewis (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxii).—By diminishing the refractory period of heart muscle by vagus stimulation, and by stimulating the muscle by rapidly succeeding shocks, the auricle may be made to beat at a rapid rate—2,000 per minute,—a state comparable to flutter being produced.—E. P.

859. The Effect of i-Inositol on the Isolated Heart of the Frog. J. A. Hewitt and D. H. de Souza (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxix).—Inositol, diluted 1 in 1,000 in Ringer's solution, stimulates the heart muscle, increasing the force, but not the rate of the heart. This occurs in the atropinised heart.—E. P.

860. Über das Electrocardiogramm des Situs Viscerum Inversus Totalis. R. Inada and M. Ishihara (*Mitt. der med. fakul.*, Kyushu, 1917, **4**, 1-10).— Eight cases of complete situs inversus showed reversed electrical variations in leads 1 and 6. Leads 2 and 4 gave in these cases variations which corresponded to leads 5 and 3 of the normal. Leads 3 and 5 corresponded to leads 4 and 2 respectively. The leads are numbered after Einthoven. —G. V. A.

861. Experimentelle Untersuchungen am Hühnerembryo. F. Külbs (*Beitr. z. Physiol.*, 1920, **1**, 439-64).—A detailed investigation of the electrical changes occurring in the surviving heart of the embryo chick at various periods of incubation.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

862. The Aviator's Heart. Roentgen Ray Studies under Conditions Simulating High Altitudes. L. T. Le Wald and G. H. Turrell (*Amer. J. Roentgenol.*, 1920, **7**, 67-89).—A series of X-ray photographs at 5-minute intervals are taken of a subject's heart as he breathes in an atmosphere the oxygen content of which is gradually diminishing. In order to avoid secondary disturbances, each exposure is taken at the same point in the respiratory cycle and with unchanged position of the body. It was found that when atmospheric air was being breathed, the size of the heart showed variations dependent on the respiratory movements. On exposure to low oxygen tensions of 89 aviators, 66 showed no increase in the size of the heart, 6 showed an apparent increase due to shifting of the heart during expiration, 3 showed a small real increase in the diameter of the organ, while in the remainder a diminution was observed due in some cases to fall of blood-pressure owing to loss of vaso-motor control.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

863. La signification des changements du rythme cardiaque produits par la perfusion avec la nicotine. D. T. Barry (*Arch. internat. de pharm. et de thérap.*, **25**, 391-401). —The author has investigated by means of tracings and electrocardiograms the effect of nicotine on the cardiac cycle in frogs, toads, and tortoises. Nicotine causes a dissociation of the rhythm of auricle and ventricle, and may produce a domination of the cycle by the ventricle. Continued application of the drug causes a cessation of the cardiac activity. Evidence is brought forward to show that under the action of nicotine each of the cavities may respond to its own points of excitation, and that a poisoned or exhausted point of excitation may pass on its function to a neighbouring point. The theories of the origin of the heart-beat are discussed, it being concluded that the action of the drug may be explained as well by the neurogenic theory as by the muscular theory, and that the effect on the heart is probably due to an effect on both muscle and nerve, though principally on the latter.—E. P.

CIRCULATION

864. Records made with the Hot Wire Sphygmograph. A. V. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54**, cxvii).—This instrument shows two main waves, one corresponding to the opening of the aortic valves, and one corresponding to their closure: it will thus measure the time during which the valves remain open. By means of two such sphygmographs the velocity of the pulse can be ascertained.—E. P.

865. Sur une double courbe représentant très exactement les oscillations sphygmométriques. H. Harlé (*Compt. rend.*, 1921, **172**, 475-6).—Pressures in cm. of mercury are plotted on abscissæ, and amplitude of oscillations on ordinates. Two curves are drawn, one for the upper extremes of the movement of the needle, and the other for the lower. From these two curves a compound curve is constructed.—J. A. M.

866. Über den Blutdruck beim Neugeborenen. A. Seitz and F. Becker (*Zent. f. Gynäkol.*, 1920, **44,** 1338-42).—The blood-pressure determinations with the Riva-Rocci apparatus on new-born infants gave values of from 45 to 75 mm. of mercury. The pressure rises at first rapidly and then more slowly during the first few days after birth. During birth the blood-pressure is from 65 to 75 mm., so that the lower values obtained just after birth represent a minimum to which the pressure falls as a result of the changed circulatory conditions.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

867. Pressure in Vessels of Bat's Wing. L. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxliv).—The observations were made with Roy and Graham Brown's apparatus. The pressure necessary to stop the flow in a main arterial branch rose from 20 mm. Hg when the bat was cold (hibernating) to 50 when it was warm. When warm, a pressure of 15 to 20 mm. Hg stopped the flow in arterioles, and of less than 1 cm. H_2O that in venules. The rhythmic pulsation in the veins is but little evident when the animal is warm.—W. D. H.

868. Klimatologische Studien. II. Wirkung der Strahlung auf den Blutdruck. O. Kestner (*Zeit. Biol.*, 1921, **73,** 7-9).—Air irradiated with the arc lamp diminishes the blood-pressure. The effective factors are substances formed by the irradiation in the air. The same substances are found on sultry days in the air without direct irradiation by the sun. On those days a diminution of the blood-pressure is to be observed in man also.—H. W.

869. Blood-Pressure Estimation by Indirect Methods. III. The Movements in the Artery under Compression. J. Erlanger (*Amer. J. Physiol.*, 1921, **55,** 84-158).—Movements of points on the exposed artery of a dog are photographed during decompression. It is found that a thin layer of blood passes through the flattened segment just before the pulse penetrates its full length. This diastolic residuum accumulates rather rapidly when the pulses begin to travel. This is due to the fact that the outer pressure does not completely empty the segment between the pulses. Shortly before the sounds of the third phase change into those of the fourth, this diastolic residuum again accumulates rapidly and at an increasing rate. At the beginning of the fourth phase, the acceleration changes to a retarding accumulation, indicating the filling of the artery to the point where the walls remain stretched during diastole. The pulse penetrates the segment further as the outer pressure decreases. This explains certain practical experiences. The first few pulses may not distend the artery. The index to the diastolic pressure is when the accelerating diminution in oscillation amplitude begins to change to a retarding diminution. A pre-anacrotic phenomenon shows itself during the time between when the pulse first begins to penetrate and the beginning of the fourth sound-phase. The pulse front increases in steepness as it progresses through the flattened artery, and small waves form in front of it. This phenomenon can be shown in tubes. In the artery *in situ* it is coterminal with the sharp Korotkoff sounds. It is concluded that the beginning of the first sound-phase develops shortly after the compressing pressure falls below the systolic pressure, and that the change from the sounds of sharp quality to those of dull quality indicates fairly accurately the moment the compressing pressure falls below the diastolic pressure.—W. M. B.

870. Behaviour of Blood-Pressure during the Use of the Stomach Tube. C. A. McKinlay (*J. Amer. Med. Assoc.*, 1921, **76,** 431-2).—There is a rise of 20 to 50 mm. in the brachial arterial pressure; the rise is greater if there is retching or in hypertension, and is not related to straining or mental excitement.—C. L. E.

871. Die arterielle Blutdruckmessung beim Pferde. J. Fontaine (*Archiv f.* [*Anat. u.*] *Physiol.*, 1919, 217-47).—Measurements by the Riva-Rocci method on the coccygeal artery, which show nothing new.—C. L. E.

872. Sulle sviluppo della funzione vasomotoria negli animali. P. Albertoni (*Arch. di Sci. Biol.*, 1920, **1,** 233-45).—The vasomotor function is almost entirely absent in

new-born dogs. Asphyxia and adrenaline cause in such animals only an insignificant increase in blood-pressure. The vagus pulse and the Traube waves are also absent. In puppies of 7 weeks, adrenaline causes only a moderate increase in blood-pressure. In the lamb, which has its eyes open at birth, the vasomotor function is sufficiently developed. These observations confirm the fact that functions develop with practice, and may explain various phenomena such as the relative incapacity of new-born animals to maintain a constant body temperature.—C. d. F.

873. Nuova dimostrazione dell' automaticita periodica del centro vasomotore bulbare. C. Foa (*Arch. di Sci. Biol.*, 1920, **1,** 266-71).—Experiments were made on dogs, and led to the conclusion that the bulbar vasomotor centre, like the respiratory centre, is automatic, and that no afferent stimuli are necessary for its function. This automatic function is periodic, and its rhythm is independent of that of the neighbouring respiratory centre.—C. d. F.

874. Plethysmographische Untersuchungen über die Wirkung der Hochfrequenzstrome. A. Kowallek (*Archiv. f.* [*Anat. u.*] *Physiol.*, 1919, 263-82).—Local electric diathermic treatment of low energy intensity causes local vasodilatation and warming. When the upper arm is treated, these changes are also seen in the forearm of the same, but not of the opposite side. This is probably due either to arterial dilatation or to a vasomotor reflex.—C. L. E.

875. Cooling and Warming of the Body by Local Applications. L. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxxvii-viii).—By putting the hands in cold or hot water, the local cooling or heating of the blood cools or warms the whole body. If the circulation in the hand is stopped by a sphygmometer cuff, this does not occur, therefore the effect is not a nerve reflex.—W. D. H.

876. Measurement of Capillary (Arteriole) Pressure in Man. L. Hill and J. McQueen (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxxiii-iv).—See Abstract No. 295, Vol. VI., p. 45.—W. D. H.

877. On the Substance Responsible for Capillary Tonus. A. Krogh and G. A. Harrop (Proc. Physiol. Soc., 1921, *J. Physiol* , **54,** cxxv).—Ringer's solution does not maintain capillary tonus when perfused through the femoral artery of frogs; the tonus is not maintained by addition of gum or of red corpuscles to the solution. The addition of ox serum, even if heated to boiling-point, enables the tonus to be maintained.—E. P.

878. Stasis and Œdema. A. Krogh and G. A. Harrop (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxv).—India ink particles introduced into the capillaries of the frog's tongue do not pass through the walls of rapidly-dilating capillaries, while a solution of vital red does. Use is made of this fact to investigate the size of the openings between the endothelial cells in capillaries.—E. P.

879. Absorption from the Peritoneal Cavity. A. J. Clark (*J. Pharm. Expt. Ther.*, 1921, **16,** 415-34).—When isotonic solutions of different salts were injected intraperitoneally into rabbits, the rate of absorption of both water and solute was in the following order: $NaNO_3$, $NaI > CH_3COONa$, $NaCl > Na_2HPO_4 + NaH_2PO_4$, $Na_2SO_4 >$ glucose. About 75% of the glucose injected was absorbed in 3 hours, but no water, and usually the volume of fluid removed was larger than that injected. The rate of absorption of both NaCl and glucose diminished after the first hour. In fact, if fluid was injected into a rabbit and allowed to remain one hour, and then injected into a second animal, the rate of absorption of both salt and water proceeded more slowly in the second than in the first animal. Variations in rate of absorption are attributed to differences in the ratio between the rates of diffusion of substances from peritoneal cavity to tissue fluids, and *vice versa*. Other conditions hastening the absorption were the presence of sodium fluoride, which increased the rate of absorption of both water and solute in the case of solutions of NaCl and glucose, also epinine, raising the temperature to 45°C.—E. M.

880. Ricerche sulla pressione di formazione della linfa. G. Jappelli (*Arch. di Sci. Biol.*, 1920, **1**, 193-224).—After intravascular injections of solutions of NaCl of different concentration, the pressure under which the lymph flows from the thoracic duct shows the following changes: After the injection of hypertonic solutions, the pressure, after a period of latency lasting 30 to 40 seconds, rapidly increases until it reaches a value which is about double that of the normal. After the injection of hypotonic solutions the pressure goes down to zero and the flow stops. After the injection of isotonic solutions the pressure increases, but the increase is small and there is no latency. This last observation agrees with Starling's transudation theory. But the other two conclusions, and particularly the remarkable increase in the pressure following a period of latency after the injection of hypertonic solutions of NaCl, are not sufficiently explained by the transudation theory, and become only intelligible if one admits the participation of other factors such as changes in the osmotic pressure within and without the endothelial wall of the lymph vessels, as well as in the endothelial wall itself.—C. d. F.

RESPIRATION

881. Über degenerative und reparatorische Vorgänge nach experimentellen Verletzungen des Rückenmarks. H. Spatz (*Zeit. f. d. ges. Neur. u. Psychiat.*, 1920, **58**, 327-37).—A detailed account of the histological changes observed after experimental section of the spinal cord.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

882. Acidosis. W. M. Bayliss (*West London Med. J.*, 1920, **25**, 76-8).—A general account of acidosis in relation to blood reaction and CO_2 content of blood and alveolar air. The author's colorimetric method for the determination of blood reaction is described.—T. R. P.

883. The Respiratory Quotient and its Uncertainty. J. A. Fries (*Amer. J. Physiol.*, 1921, **55**, 53-64).—A warning against conclusions drawn from short periods of observation. The difference between fasting and digesting subjects as regards intestinal gases has to be kept in mind. In ruminants, the fermentation gases make up a large proportion of the total CO_2 given off in a respiration calorimeter. The marsh gas must also be taken into consideration. It is desirable to have researches made on the ratio of CH_4 to CO_2 in the fermentation processes.—W. M. B.

884. The Carbon Dioxide Absorption Curve Tension of the Blood. I. Of Normal Resting Individuals. J. P. Peters, Jr., D. P. Barr, and F. D. Rule. **II. In Cardiac Dyspnœa.** J. P. Peters, Jr., and D. P. Barr. **III. In Severe Anæmia.** D. P. Barr and J. P. Peters, Jr. (*J. Biol. Chem.*, 1921, **45**, 489, 537, 571-92).—I. The CO_2 dissociation curve, the CO_2 content of arterial and venous blood, and the composition of the alveolar air were determined in 3 normal subjects. The alveolar tension of CO_2 varied in general with the height of the absorption curve, so that the acidity of the blood of an individual equilibrated with the same CO_2 tension will fall between the limits of P_H, 7·42 and 7·29. The alveolar CO_2 tension of an individual is constant, but the alveolar CO_2 tension may be 10 to 11 mm. Hg lower than the arterial CO_2 tension. An equation is suggested for correcting the CO_2 dissociation curve for the degree of unsaturation of oxyhæmoglobin. The loss of oxygen in the systemic capillaries compensates for the increase in the CO_2 content, so that the acidity of arterial and venous blood is almost identical. II. Cardiac decompensation depresses the CO_2 dissociation curves, and in several cases improvement of symptoms was accompanied by a rise of the curve to values corresponding to those of normal individuals. The differences between CO_2 tension in alveolar air and arterial blood is greater than in control cases. III. The blood in severe anæmia has a diminished power of combining with or setting free CO_2. The arterial

acidity is low, but the venous is remarkably constant, indicating that it is the tissue acidity which regulates the respiratory movements.—H. E. R.

885. The Cardio-Respiratory Mechanism in Health and Disease. R. G. Pearce (*Arch. int. Med.*, 1921, **27,** 139-67).—Normally, the volume of alveolar ventilation, the volume of oxygen absorbed, and the volume of cardiac output all increase proportionally at moderate levels of physical exertion. At higher levels, when the third factor is less than demanded, the safety factors are: (1) The gas-carrying power of the blood, (2) the increase of venous pressure due to increase of muscular action, and (3) the power of the body to superventilate the lungs. In various diseases the upset of the mechanism is described, but the author admits the methods of examining it are not well adapted for clinical practice.—W. D. H.

886. Anæsthetics and Respiratory Centre. J. W. Trevan and E. Boock (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxxi-ii).—Experiments on decerebrate and whole cats anæsthetised with urethane. The ventilation at different alveolar CO_2 tensions was plotted against the calculated H-ion concentration of the plasma. The points lie along a straight line intersecting the base line between 0·24 and $0{\cdot}29 \times \lambda\ 10^{-7}$. This is called the apnœic threshold; as narcosis comes on and reflexes disappear the slope of the graph lessens—*i.e.*, the sensitiveness of the centre is less—but the apnœic threshold is not changed at first; later the graph intersects the base line on the alkaline side of the threshold, and finally the graph becomes parallel to the base line—*i.e.*, the centre is no longer stimulated by increased acidity of the blood. Ether produces similar effects.—W. D. H.

887. Anoxæmia and the Administration of Oxygen. D. K. Adams and N. Morris (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cii, cvi, cvii).—(1) The oxygen saturation of arterial and venous blood during asphyxia was investigated in cats and dogs. It was found that there was a gradual fall in arterial oxygen saturation as anoxæmia increased, this fall not being strictly proportional to the fall in venous oxygen. At a certain point the oxygen saturation of venous blood became greater than that of the arterial. (2) The fall in the arterial and venous content produced by unilateral pneumothorax or occlusion of a bronchus is removed by administration of oxygen. (3) Administration of oxygen previous to the induction of unilateral pneumothorax prevents a fall in arterial saturation.—E. P.

888. Respiratory Waistcoat. B. A. McSwiney (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxxiii).—A waistcoat is described provided with balloons to attach to manometers for measuring expansion in various parts of the chest wall.—W. D. H

ALIMENTARY CANAL

889. Über Rumination im Säuglingsalter. E. Somersalo (*Arch. f. Verdauungskrankh.*, 1920, **26,** 167-91).—Description of 2 cases of rumination in infants due to over-sensitiveness of the alimentary canal and to general nervous disorders.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

890. Gastric Analysis. I. Fundamental Principles. M. E. Rehfuss and P. B. Hawk (*J. Amer. Med. Assoc.*, 1921, **76,** 371-3).—The uses of gastric analyses are, the determination of motor and secretory activity and the determination of the presence of abnormal products. The normal variations, especially in the direction of increased acidity, are considerable. Standardisation of test meals is of the greatest importance.—C. L. E.

891. Gastric Analyses. II. The Interdigestive Phase, or the Principles Governing the Phenomena of the Resting Stomach. M. E. Rehfuss and P. B. Hawk (*J. Amer. Med. Assoc.*, 1921, **76,** 564-6).—Secretion in the stomach is active even in the inter-

digestive phase. The interdigestive period reveals 3 phenomena: The first motor, in which peristole and tonal and hunger contractions supplant peristalsis; the second a lessening in secretory activity, with reduction of acidity to one-half; and the third an alteration in the status of the stomach and duodenum. In disease, the interdigestive period may be completely obliterated.—C. L. E.

892. Estimation of Gastric Function. J. H. Ryffel (*Lancet*, 1921, i., 586-8).—The author has examined the 2 principal forms of test meal (Ewald, tea and toast; Boas, oatmeal and water), and describes the methods to be adopted and the errors to be avoided. The method serves, not so much for actual diagnosis, but for preliminarily placing a case in one of various groups.—W. D. H.

893. Detection of Lactic Acid in Stomach. E. Pittarelli (*Bull. acad. méd.*, 1920, **84,** 132-5).—This new method is applicable to various organic fluids, and is based on the change of lactic acid to acetaldehyde by permanganate in neutral medium. Acetaldehyde is tested by the red colour it strikes with phenyl hydrazine—HCl, diazosulphanilic acid, and alkali. Even 1 part in 70,000 can be detected.—W. D. H. (*Chem. Abstr.*).

894. Über die Folgen der Vagusdurchschneidung, insbesondere ihre Wirkung auf die Funktionen des Magens. M. Litthauer (*Arch. f. klin. Chirurg.*, 1920, **113,** 712-36).—A detailed account of the effects of vagotomy on respiration, and more particularly on the movements and secretory activity of the stomach. From the observation that an irregular secretion of gastric juice occurs after section of the vagi, but not in the intact animal, it is concluded that the activity of the pyloric ganglion cell plexus which acts as a secretory centre for the gastric glands is regulated by the vagi. The chemically induced secretion in the whole of the stomach is brought about by the absorption of products of gastric digestion in the pylorus—a fact of considerable importance in connection with surgical operations involving interference with this region.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

895. Die Einwirkung roher Zwiebel auf die Magenverdauung. E. Wilbrand (*Münch. med. Woch.*, 1920, **67,** 1174).—Eating raw onion delays gastric digestion, but raises the acidity, and causes a greater flow of gastric juice. It is recommended as a means of preventing cholera and typhus.—J. H. B.

896. Die Verdauung von Saüglingsnahrung. T. Schmiesing (*Zeit. physiol. Chem.*, 1921, **112,** 295-300).—Various milk mixtures were given to a dog with a duodenal fistula whose cannula was situated directly opposite the opening of the lower pancreatic duct. They displayed no effect of any significance on the motility of the stomach or the secretion of gastric juice.—H. W. D.

897. Über Dickdarmperistaltik. Beobachtungen am experimentellen Darmfenster. B. Zondek (*Arch. f. Verdauungskrankh.*, 1920, 18-23).—Peristalsis of the large intestine occurs at nearly regular intervals (about every half-minute). Antiperistalsis also occurs. In hunger the peristalsis is considerably retarded (intervals of 86 minutes). The excitation caused by food is very much greater than that by the vagus nerves. (Does the vagus supply the colon ?—W. D. H.).—H. W.

898. La digestion des graisses et le diagnostic de l'insuffisance pancréatique. M. Labbé and H. Labbé (*Ann. de méd.*, 1920, **7,** 424-35).—A detailed method is given for the estimation of the degree of utilisation of total fat, neutral fat, fatty acids, soaps, and unsaponifiable fat of a diet. Although the utilisation was less perfect in conditions of pancreatic insufficiency, the very considerable reduction in the degree of splitting of neutral fat previously described was observed. But in the absence of the pancreatic secretion this splitting was probably only at all complete in the lower portions of the intestine.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

899. Ricerche sopra gli acidi tauro e glicocolico in bile della cistifellea nella infanzia. R. Grego (*Boll. d. soc. med. chirurg. di Modena*, 1920, **20-21,** 41-59).—Bile salts were

found to be absent from the bile of fœtuses, of prematurely born infants, and of those which died at once after birth. These salts were not certainly present until the end of the third month, but after this they were always found except in cases of acute liver diseases.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

900. Zur experimentellen Erzeugung des Gallenblasenhydrops. R. Toida (*Mitt. der med. Fac. Univ.*, Kyushu, 1920, **5**, 131-44).—The conditions necessary for a development of a hydrops of the gall-bladder are: an occlusion of the in- and out-flow of the bile, a free circulation, and a bacterial infection. The infection should not be too virulent, otherwise it results in an inflammation and necrosis.—G. V. A.

901. Über die chemische Zusammensetzung der menschlichen Blasengalle. R. Toida (*Mitt. der med. Fac. Univ.*, Kyushu, 1920, **5**, 327-35).—Human bile obtained from the gall-bladder by a puncture was analysed. It was found to be richer in total solids than the liver bile. The bladder bile contained 40 times as much bile-acids as the liver bile, and was 10 times richer in soaps, 9 times in fats, and 6 times in cholesterol and lecithin. Japanese appeared to have more soap and much less cholesterol, bile acids, and lecithin in their bile than Europeans. No difference was found between the bile of men and women.—G. V. A.

902. Über ausgedehnte Resektion des Dünndarmes und zugleich ein Beitrag zur Stoffwechseluntersuchung des betreffenden Falles. R. Toida (*Mitt. der med. Fac. Univ.*, Kyushu, 1920, **5**, 373-90).—A case of resection of 317 cm. (54%) of the small intestines did not show any disturbances of digestion. The motions were normal and regular—once or twice a day. The unabsorbed part of the proteins was about 17, of fats 14, and of carbohydrates 0·5%.—G. V. A.

903. Beiträge zur Physiologie der Leber. I. Das Verhalten der Leber im Hungerzustande. II. Das Verhalten der Leber bei einseitiger Ernährung mit Eiweiss. P. Junkersdorf (*Pflüger's Arch.*, 1921, **186**, 238-53, 254-64).—The loss of weight of the dog's liver in starvation is proportional to the loss of glycogen. After 11 days the glycogen content is on an average 0·59% and the fat 15·36%. Water is also lost. In protein feeding glycogen can be formed from protein. When the glycogen content of the liver increases the fat is diminished. The weight of the liver increases.—C. L. E.

904. Action of Salts on Liver. M. Einhorn (*New York Med. J.*, 1921, **113**, 313-20).—Various aperient salts were administered into the duodenum, and the amount of bile formed judged by the subsequent colour of the duodenal contents, allowance being made for the darker colour of bile, which had been previously stored in the gall-bladder. The efficacy of $MgSO_4$ and Na_2SO_4 as liver stimulants is considered proved, and the duodenal method is recommended instead of giving them by the mouth.—W. D. H.

905. Removal of the Liver in Dogs. F. C. Mann (*Amer. J. Med. Sciences*, 1921, **161**, 37-42; *Proc. Amer. J. Physiol.*, 1921, **55**, 285-7).—The method employed is described in full. The animal recovers from the actual operation, lives 5 to 11 hours with characteristic toxæmic symptoms (tremors, convulsions, muscular weakness, Cheyne-Stokes breathing, rapid pulse, coma, etc.), and generally dies from respiratory failure.—W. D. H.

DIET

906. Weitere Untersuchungen über das Stickstoffminimum. K. Thomas and H. Straczewski (*Archiv f. [Anat. u.] Physiol.*, 1919, 249-62).—An attempt was made to learn the stages of protein breakdown on a minimal protein intake with abundant carbohydrate; the amino-acid chosen for tracing was cystine. If brombenzene is given by the mouth or subcutaneously, any intermediary free cystine is excreted as bromphenylmercapturic acid when the dogs are given mixed diet; not so with protein starvation, in which no

trace of the cystine derivative is excreted. The conclusion is that under these conditions protein is not broken down in the ordinary autolytic fashion.—C. L. E.

907. Nutrition in Vienna. Madge R. Gribbon and Margaret I. H. Ferguson (*Lancet*, 1921, i., 474-7).—Accurate statistical and other data revealing the serious condition in this city.—W. D. H.

908. "Rope" in Bread. D. J. Lloyd, A. B. Clark, and E. D. McCrea (*J. Hygiene*, 1921, **19**, 380-93).—Skins of grains, flour, and bread contain 6 types of *B. mesentericus*, 5 of which were found in ropy or sour bread. "Rope" only results when favourable conditions (moisture, temperature, reaction, etc.) allow of their great development.—W. D. H.

909. Über den Einfluss der Grösse einer Futterration auf die Verdaulichkeit derselben. F. Honcamp and A. Koch (*Die landw. Versuchsstat.*, 1920, **96**, 45-120).—The digestibility of a diet decreases as the amount of the ration is increased, because the cellulose is less completely broken down by intestinal bacteria.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

910. Cottonseed Meal as a Feed for Hogs. J. C. Burns (*Cotton Oil Press*, 1920, **4**, 56-8).—Details of feeding experiments. Mixed with milo chops, the meal was given with and without fermenting the mash. One group of hogs received also copperas in its ration. The results indicate that there is no advantage in fermenting the feed, and that $FeSO_4 \cdot 7H_2O$ is of doubtful value. The greatest gain in weight per head was made on 1 part cottonseed meal to 3 parts milo meal, and the cost per pound gained was lowest with this ration. If not over 10% of the whole ration is cottonseed meal, it may be used to advantage over long periods and without danger of injurious effects.—W. D. H. (*Chem. Abstr.*).

911. Diseases of Infants due to Prolonged Feeding with Excess of Carbohydrates. C. E. Bloch (*Brit. Med. J.*, 1921, i., 293-5).—The conditions brought about by a diet consisting chiefly of carbohydrate resemble those due to chronic inanition. The store of fat and protein is drawn upon, and, being weak from birth, the child loses weight rapidly as soon as suckling ceases. A spongy and hydræmic condition of the tissues develops, which is a direct consequence of the carbohydrate diet. If this is even partly changed the œdema disappears. The muscles often show a peculiar rigidity and tone. The child is very susceptible to all infections. Colitis may occur. The prognosis is always serious. A proper diet, careful nursing, and the use of stimulants are the chief points in the treatment.—D. H. de S.

VITAMINS

912. Accessory Food Factors. Elsie Dalyell (*Med. J. Australia*, 1921, **8**, 61-5).—A general account of vitamins based on the Report of the Medical Research Committee (see Vol. IV., Review, p. 514).—W. D. H.

913. Vitamins and Common Sense. W. D. Halliburton (*Lancet*, 1921, i., 308).—A warning against loose talk and haphazard reasoning, especially by those not competent to deal with the subject.—W. D. H.

914. The Vitamin Question. E. P. Häussler (*Schweiz. Apoth.-Ztg.*, 1920, **58**, 621-6, 634-40, 655-8).—A review of the history of vitamins and of the theories as to their chemical nature. Tschirch's theory of the function of vitamins (*Schweiz. med. Woch.*, 1920, No. 2, 21) in building up the animal organism is as follows: The organism cannot, unaided, synthesise from aliphatic amino-acids such cyclic compounds as, *e.g.*, purine and pyrimidine bases, which are so essential in the formation of nucleic acids, or cellular nuclei. The synthesis, however, takes place in presence of enzyme-like substances, "Cyclokeiases"—*i.e.*, "ring closers"—which contain, or perhaps are identical with, the vitamins themselves.—W. D. H. (*Chem. Abstr.*).

915. Weitere Beiträge zur Kenntnis von organischen Nahrungsstoffen mit spezifischer Wirkung—III. E. Abderhalden and L. Schmidt (*Pflüger's Arch.*, 1920, **185,** 141-6).—Inconclusive experiments on oxygen consumption of muscle from normal and beri-beri pigeons and on the effects of yeast and muscle extract on the respiration of such (as of other) muscle —C. L. E.

916. Weitere Beiträge zur Kenntnis von organischen Nahrungsstoffen mit spezifischer Wirkung. IV. Gaswechseluntersuchungen an mit geschliffenem Reis mit und ohne Hefezusatz ernährten Tauben. E. Abderhalden (*Pflüger's Arch.*, 1921, **187,** 80-9).—The gaseous metabolism of pigeons fed on polished rice was lowered, but was quickly restored by addition of yeast to the food.—C. L. E.

917. The Nutritive Value of Extra-Yeast Bread. P. B. Hawk, C. A. Smith, and O. Bergeim (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 110-1).—Eleven albino rats fed on ordinary bread, inorganic salts, and butter, grew very poorly, gaining on the average only 18 gms. in 9 weeks; 11 rats fed on bread made with extra yeast, together with inorganic salts and butter, grew much better, gaining 59 gms. on the average in 9 weeks. The superior nutritive value of the extra-yeast bread was ascribed to its high content of water-soluble vitamin B and to the action of the protein of the yeast.—D. H. de S.

918. Il caffé e le vitamine. P. di Mattei (*Policlinico, sez. prat.*, 1920, **27,** 1011-3).—Roasted coffee contains vitamin capable of curing "polished rice" neuritis. Excessive feeding on vitamin produces no characteristic effect.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

919. Fat-Soluble Vitamin. H. C. Sherman, F. L. MacLeod, and M. M. Kramer (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 41-3).—Experiments on young rats show that skimmed milk contains a significant amount of fat-soluble vitamin, probably about half as much as whole milk. It is not only essential to growth, but also influences reproduction. A surplus of the vitamin above the immediate needs of growth or maintenance may be stored in the body, and subsequently used to meet the needs of reproduction and lactation, or to carry the animal over a period of subsistence upon foods deficient in this vitamin. Dry heating at a temperature of 100° C. with free access of air only very slowly destroyed fat-soluble vitamin.—D. H. de S.

920. Aeration and the Antiscorbutic Factor. S. S. Zilva (*Lancet*, 1921, i., 478).—All the present data on the behaviour of vitamins A and C need reconsideration since the discovery that oxidation is an important factor also in their destruction. If air is excluded or replaced by CO_2, heating to boiling-point for 2 hours causes no lessening of the antiscorbutic properties of preparations.—W. D. H.

921. The Effect of Temperature and of Hydrogen-Ion Concentration upon the Rate of Destruction of Antiscorbutic Vitamin. V. K. Lamer, H. L. Campbell, and H. C. Sherman (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 122-3).—In the case of tomato juice, boiling for 1 hour destroyed 50, and for 4 hours 70% of the antiscorbutic vitamin present. When the natural acidity of the juice was first neutralised wholly or in part, and when the juice was made alkaline, the rate of destruction of the vitamin on boiling was increased.—D. H. de S.

922. Swelling of the Pinna. H. Sheasby (*Practitioner*, 1921, **106,** 215-6).—This is an early sign of deficient antiscorbutic vitamin; the exciting cause is sleeping on hard pillows, and it was very noticeable in internment camps.—W. D. H.

923. The Disadvantages of Dried Milk in Infant Feeding. J. Burnet (*Practitioner*, 1921, **106,** 170-1).—This article, from a practical physician, deserves noting. The main dangers are scurvy and rickets.—W. D. H.

METABOLISM

924. Auszug aus: Beiträge zur Physiologie der Klimawirkung. VII. Der Einfluss des Aufenthalts in einer Walderholungsstätte nahe der Grossstadt auf den Stoffwechsel und das Wachstum von Schulkindern der arbeitenden Klassen (zugleich ein Beitrag zur Physiologie des Wachstums). F. Müller (*Zeit. f. physik. u. diätet. Therap.*, 1920, **24,** 420-37).—Observations on the increased energy usage of school-children residing in a forest convalescent home in comparison with that of the town children. The energy exchange was greatest in summer, but the increase of weight was the least. It is recommended, therefore, to prolong the period of country treatment as late into the autumn as November.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

925. Auszug aus: Beiträge zur Physiologie der Klimawirkung. VIII. Der Einfluss des Aufenthalts an der Nordsee auf den Stoffwechsel von Schulkindern der arbeitenden Klassen. C. Häberlin and F. Müller (*Zeit. f. physik. u. diätet. Therap.*, 1920, **24,** 437-41).—Residence by the North Sea is even more beneficial—to judge by energy exchanges and increase of body-weight—than residence in the country.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

926. Measurement of Rate of Metabolism. H. M. Jones (*Arch. int. Med.*, 1921, **27,** 48-60).—A simple portable apparatus for measuring the rate of oxygen consumption is described and illustrated; it was found adequate for clinical needs.—W. D. H.

927. Calorimetry: Its Application in Clinical Medicine. M. H. Fussell and L. Jonas (*The Medical Clinics of North America*, 1921, **4,** 989-1004).—Examples of the value of the estimation of basal metabolism in diagnosis and treatment.—C. L. E.

928. Die energetische Betrachtung über den Stoffwechsel des japanischen Säuglings. T. Yano (*Mitt. der med. Fak. Univ.*, Kyushu, 1920, **5,** 189-207).—A study on growth of Japanese new-born babies on diets of different calorific values. The results are on the whole similar to those found in European children.—G. V. A.

929. Influence of Diet on Energy Expenditure in Work. J. B. Orr and J. P. Kinloch (*J. Roy. Army Med. Corps*, 1921, **36,** 81-6).—The energy expenditure per work unit is influenced by the nature of the preceding meal. Following a high protein meal, the increase due to work is greater than in the preceding post-absorptive state; following a high carbohydrate meal the increase is less; following a high fat meal there is a summation of extra energy expenditure due to food and that due to work. These differences are regarded as due to differences in the mechanism of stimulation involved in the metabolic increase following the ingestion of the 3 sorts of food.—W. D. H.

930. Normalgewicht und Ernährungszustand. M. Berliner (*Berlin. klin. Woch.*, 1921, **58,** 58-60).—Statistical tables from which body-weight and nutritive state are correlated.—W. D. H.

931. Entwicklung bei Kindern von 2 bis 6 Jahren. C. Schiøtz (*Norsk. mag. f. lægevidenskaben*, 1920, **81,** 425-59).—Particulars of measurements of height and weight of 513 children, constituting a mass of information which must be consulted in the original. It is interesting to observe that the index recommended by the author by which the physical development of a child is to be judged is the degree of calcification of the skeleton (as shown by a radiogram of the wrist) correlated with the body-length.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

932. The Regulation of the Water Content of the Human Organism. E. F. Adolf (Proc. Physiol. Soc., 1920, *J. Physiol.*, **54,** cxxiii).—Observations on the water content of the body under various conditions, and on diuresis produced by excessive water intake.—E. P.

933. Influence of Dry versus Fresh Green Plant Tissue on Calcium Metabolism. E. F. Robb (*Science*, 1920, **52,** 510).—Mellanby states that the antirachitic vitamin

is not destroyed by drying, while the antiscorbutic vitamin is greatly reduced except in acid foods. This is contrary to the conclusions of Hart. In the present experiments, guinea-pigs that had been on a diet of dried plants 14 or 21 days before the experimental period eliminated twice as much Ca as those that had been on a green diet. Scurvy appeared in all animals on the dry diet. The author suggests that the loss of Ca in the experiments of Hart and others may have been due to scurvy.—W. D. H. (*Chem. Abstr.*).

TEMPERATURE

934. Centre of Heat Tachypnœa in the Rabbit. D. Ogata (*Mitt. der med. Fak. Univ.*, Kyushu, 1917, **4**, 11-34).—Heating of the carotid blood in rabbits produces tachypnœa, which does not occur after the removal of the corpus striatum or after a puncture of the mid-brain. In cases when the corpus striatum remained in connection with the thalamus the tachypnœa was still observed. The marked disturbance of the regulation of the body temperature is more pronounced in rabbits with the corpus striatum removed than in those with mid-brain puncture. No difference was observed in production of the heat tachypnœa on heating of the carotid blood or of the whole body.—G. V. A.

935. Über das Kreatin und Kreatinin. T. Takahata (*Mitt. der med. Fak. Univ.*, Kyushu, 1920, **5**, 271-326).—Numerous observations, from some of which the author concludes that creatine and creatinine play a rôle in the regulation of the body temperature.—G. V. A.

936. The Value of the Quasi-continuous Temperature Record. Sir G. S. Woodhead and P. C. Varrier-Jones (*Lancet*, 1921, i., 573-82; compare Abstract No. 212, Vol. I., p. 75).—The late Professor Gamgee's method was used and its value attested, especially in the early diagnosis and prognosis of tuberculosis.—W. D. H.

937. I. Die Körpertemperatur junger Wanderratten (Mus decumanus) und ihre Beeinflussung durch die Temperatur der Aussenwelt (Die Umwelt der Kleinplasmas—VIII. J. A. Bierens de Haan (*Anz. d. Akad. Wiss. Wien, mathem.-nat. Kl.*, 1920, **1920**, 155-6). **II. Erniedrigung der Körpertemperatur junger Wanderratten durch chemische Mittel und ihr Einfluss auf die Schwanzlange (Die Umwelt der Kleinplasmas—IX.** J. A. Bierens de Haan and H. Przibram (*ibid.*, 156-7).—I. Details of the body temperature and its variations in rats of both sexes and in the young. II. A study of the effect of antipyretics on tail development.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

DIABETES

938. Renal Threshold for Glucose. K. Goto and N. Kuno (*Arch. int. med.*, 1921, **27**, 224-37).—Details of the results in 55 Japanese persons are given. The variations, which are numerous, must be consulted in the original paper. In those individuals where it was low, the threshold for water, urea, and chlorides was normal. These people exhibit glycosuria (renal) after moderate doses of glucose, without any symptoms of diabetes or disturbance of carbohydrate metabolism.—W. D. H.

939. Renal Efficiency and Hyperglycæmia. L. A. I. Maxwell (*Med. J. Australia*, 1920, **7**, 551-3).—Renal inefficiency was present in 58% of the diabetics examined; this factor must be taken into account in blood-sugar estimations. In 4/5 of the cases the blood showed increased concentration. Lipæmia was not a marked feature.—W. D. H.

940. Diabetes, Series 2. F. M. Allen (with Mary B. Wishart in second paper) (*Amer. J. Med. Sciences*, 1921, **161**, 16-32, 165-93).—(1) In former work the effect

produced by changing the mass of pancreas left in dogs was ascertained. In this, the effect of changes in body mass are considered. This was done by comparing large and small dogs, or by amputation, undernutrition, etc. The assimilation power rises and falls inversely with the body-weight. Undernutrition is the most important factor, and clinically should be adopted to relieve the strain on the pancreas. (2) This deals with the effects of exercise on diabetic dogs and men. Exercise raises the blood-sugar normally, and raises the assimilation limit for a test dose. In diabetics it lessens hyperglycæmia and facilitates utilisation of sugar, unless the disease is too advanced. Exercise does not appear to throw any extra strain on the pancreas. In practical treatment exercise cannot replace dietary restriction or atone for excessive feeding. The fundamental value of exercise, however, is due to its being a form of undernutrition.—W. D. H.

941. Studies in Diabetic Acidosis. E. G. B. Calvert, E. B. C. Mayrs, and T. H. Milroy (*J. Path. and Bact.*, 1921, **24,** 91-116).—An examination of the urines of normal and diabetic persons. In normal persons the total output of alkali rises slightly in diuresis, while the % of N excreted as ammonia is reduced. The relative ammonia curve follows the curve of reaction. In a mild diabetic with acidosis these effects were reduced, Administration of bicarbonate reduces the acidity of normal urine, but affects that of diabetic urine to a much smaller extent. The "alkaline tide" is not seen in diabetics. In sleep in normal individuals there is a very mild acidosis.—C. L. E.

942. The Hypophysis in Diabetes Mellitus. E. J. Kraus (*Virchow's Arch.*, 1920, 228, 68-133).—In a number of cases of diabetes characteristic histological changes were found in the anterior lobe of the hypophysis. In 2 cases the anterior lobe was distinctly smaller than normal, poor in eosinophile cells, and those present were small, of abnormal form and arrangement, showed nuclear and other changes. These are due to an interference with the formation of eosinophile cells, and the degenerative changes are due to the toxic effect of diabetes. These changes are specific. In a large number of young diabetics the cells were of fœtal type, and accompanied by areas of atrophy referable to vascular degeneration. On the basis of numerous animal experiments and histological studies in man it may be stated that the anterior lobe of the hypophysis, particularly the eosinophile cells, exerts a regulatory function upon carbohydrate metabolism. Increase in eosinophile cells (hyperfunction) reduces carbohydrate tolerance, while a reduction (hypofunction) increases tolerance.—W. D. H. (*Chem. Abstr.*).

943. Sapræmic Glycosuria. C. G. Higginson (*Brit. Med. J.*, 1921, i., 296-8).—Cases are described, including the case of the author himself, which bring out the point—apt to be overlooked—that the sapræmia from a carbuncular or gangrenous focus may cause glycosuria.—D. H. de S.

944. The Carbohydrate-Fat Ratio in Relation to the Production of Ketone Bodies in Diabetes Mellitus. W. S. Ladd and W. W. Palmer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 109-10).—The ratio of carbohydrate to fat necessary for complete oxidation of the fat may be about the same as Zeller obtained in normal individuals.—D. H. de S.

945. Ilots de Langerhans géants chez un nouveau-né, issu de mère glycosurique. G. Dubreuil and Anderodias (*Compt. rend. soc. biol.*, 1920, **83,** 1490-3).—The child of a glycosuric mother was found to have much larger islets of Langerhans in the pancreas than normal.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

URINARY SYSTEM

946. Removal of the Pronephros of Amblystoma punctatum. Ruth B. Howland (*J. Exp. Zool.*, 1921, **32,** No. 3).—All embryos from which both head kidneys are removed give evidence of weakened heart action and œdema, and die within 12 days. Double

extirpation of the pronephric tubules does not affect development of the glomeruli. The presence of one pronephros suffices to keep the animals alive. After unilateral operations the remaining pronephros shows marked hypertrophy.—W. D. H. (*W. I.*).

947. Beiträger zur Physiologie und Pharmakologie der Nierenfunktion—I. K. Tamura and M. Miwa (*Mitt. der med. Fak. Univ.*, Tokyo, 1920, **23**, 317-48).—The oxygen consumption of the kidney does not vary greatly during normal secretion or during alteration in the velocity and volume of the blood flowing through it, or even after injection of such diuretics as NaCl, Na_2SO_4, and caffeine. The authors conclude that whereas the kidney requires a good deal of energy for its upkeep, very little is necessary for the performance of secretion; they conceive of 2 types of permeability—physical (passive) and physiological (active), the latter being comparable to the activity of true secreting glands, but differing from it in requiring much less energy.—R. K. S. L.

948. Les gaz irritants et la fonction renale. A. Richaud (*Bull. de la soc. de chim. biol.*, 1921, **3**, 44-7).—The effects of irritant gas on the kidney were studied in 161 cases; in 11 cases the renal permeability was estimated by injection of indigo-carmine, and by the method of Ambard. The results show that (1) albuminuria is a common accompaniment of poisoning by irritant gases, and (2) that the effect of such gases is to diminish the renal permeability. These effects are generally transitory.—E. P.

949. Residual Nitrogen in Kidney Diseases. M. Rosenberg (*Arch. exp. Path. Pharm.*, 1920, **87**, 86-113).—A proper understanding of the situation cannot be derived solely from data regarding the N balance, since 3 other factors appear to play a rôle in different disturbances. These factors are (1) protein decomposition into toxic products, (2) the utilisation of protein residues in the formation of intermediary N-containing compounds, (3) the removal of the retention material from the blood by the tissues or the reverse. In the purely mechanical anuria of the essentially intact kidney the first and second factors do not appear to be involved; in sublimate anuria and after complete nephrectomy the first factor is considerable; in nephritis characterised by hypoazoturia all 3 factors are of great importance. Because of the varied distribution of the retention materials in the blood and in tissues in different manifestations of azotemia, simple estimation of blood retention does not furnish an exact measure of the total retention, although within certain limits the one will parallel the other. The formula of Weill for the determination of total retention is not valid.—W. D. H. (*Chem. Abstr.*).

950. Absorption of Local Anæsthetics through the Genito-Urinary Organs. D. I. Macht (*J. Pharm. Expt. Ther.*, 1921, **16**, 435-48).—Local anæsthetics such as cocaine, olypin, and apothesin were more or less readily absorbed through the urethra, ureter, pelvis of kidney, præputium, and vagina of dogs. They were very poorly absorbed from the urinary bladder.—E. M.

URINE

951. The Influence of Intravenous Injections of Acacia-Glucose Solutions on Urine Excretion and Blood-Volume in Rabbits. P. M. Mattill, Katherine Mayer, and L. W. Sauer (*J. Pharm. Expt. Ther.*, 1920, **16**, 391-400).—Glucose solutions (30 to 40% strength) injected into rabbits at a uniform rate of 7 gms. per hour for 1½ hours produced diuresis and a diminution of blood-volume. If acacia (3% or more) were added to the glucose solution, the diminution of blood-volume was prevented. The acacia only slightly diminished the diuretic effect produced by the gluose.—E. M.

952. The Phosphate Excretion in the Urine during Water Diuresis and Purine Diuresis. J. Bock and P. Iversen (*Det. Kgl. Danske Videnskabernes Selskab. Biol. Meddelelser*, 1921, **3**, 3-28).—Urine and plasma phosphate were estimated by Iversen's micro-method

(Abstract No. 2900, Vol. V., p. 462) at intervals during water or theophyllin diuresis. The results showed that, whereas in water diuresis the phosphates of urine and plasma remained almost stationary, in theophyllin diuresis the phosphate of urine was increased and that of the plasma was diminished. It is concluded that phosphate excretion is effected by a mechanism which is independent of that for water excretion.—C. L. E.

953. Über proteolytische Enzyme im normalen und pathologischen Harne. S. G. Hedin (*Zeit. physiol. Chem.*, 1921, **112,** 252-81).—The proteoclastic enzymes of urine have been investigated as to their action on (1) casein in alkaline solution, (2) Witte's peptone in alkaline solution, and (3) casein in acid medium. (1) Normal urine has either no action, or, at most, only a very slight action on casein in alkaline solution. In pathological conditions, for instance, during the fever of pneumonia this action is very definitely greater, and is more pronounced still in severe cases of albuminuria. (2) The hydrolysis of Witte's peptone in alkaline solution is a constant property of normal urine. During the stage of fever in pneumonia this action is increased, as also in cases of leucæmia, although here the action on alkaline casein solution is not correspondingly greater. In albuminuria the increase of action on peptone is strongly marked. (3) Normal urine has a definite action on casein in acid medium, but no regular increase in activity has been noted in pathological cases.—H. W. D.

954. Mechanism of Urea Excretion. J. Oliver (*J. Exp. Med.*, 1921, **33,** 177-85).—By administration of urea to rats and subsequent fixation of the kidneys by injection with an acetic acid methyl alcohol solution of xanthydrol $[O(C_6H_4)_2CH.OH]$ the urea compound $O(C_6H_4)_2CH.NH.CO.NH.CH(C_6H_4)_2O$ is precipitated *in situ*. It is found especially concentrated in the cells of the proximal convoluted tubule, but also in the glomerular filtrate in smaller concentrations. Active excretion by the convoluted tubules is indicated by these experiments.—C. L. E.

955. Versuche über die Beziehung zwischen der aktuellen Reaktion des Blutes und des Harnes. R. Bahlmann (*Diss. Utrecht*, 1920).—Experiments on the perfusion of the frog's kidney with solutions of varying acidity. The urine was found in all cases to be more acid than the perfusion fluid, even when that was relatively strongly alkaline. Incidentally it should be mentioned that the perfusion was carried out through the aorta, and that ligature of the renal portal vein produced no appreciable effect on the urea and glucose concentration of the urine.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

956. Der Verlauf der Kreatininausscheidung im Harn des Menschen mit besonderer Berucksichtigung des Einflusses der Muskelarbeit. W. Schulz (*Pflüger's Arch.*, 1921, **186,** 126-72).—The daily creatinine excretion is moderately constant on creatine-free diet and independent of the volume of urine. It falls steadily during starvation. There are 3 daily maxima, at about 10 a.m., 2 to 4 p.m., and 8 to 10 p.m., and these are unaltered in starvation. Creatine is absent except durnig starvation. During muscular exercise, whether in the fed or fasting subject, there is a rise in the creatinine output, though apparently no increase in the daily excretion.—C. L. E.

957. De l'élimination de l'acide hippurique à l'état normal et pathologique. P. L. Violle (*Ann. de méd.*, 1920, **7,** 272-9).—On a non-vegetable diet the hippuric acid output is less than on ordinary mixed diet. The absence of vegetable food leads to a diminution in the rate at which glycine and benzoic acid administered together by the mouth are eliminated as hippuric acid. In cases of kidney diseases the power of the kidney to synthesise hippuric acid is much reduced and even absent.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

958. Über den Nachweis von Azeton im Harn. H. Citron (*Deutsch. med. Woch.*, 1920, **46,** 1439).—A modification of the iodoform test with the distillate from urine. The apparatus is figured.—W. D. H.

959. Substances which form Acetone in Urine and the So-called Physiological Acetonuria. E. Pittarelli (*Rif. med.*, 1920, **36,** 303-6).—A substance is present in urine which combines with acetone and thus masks the presence of the latter. The existence of this substance explains the negative result of the acetone test in a urine which yielded acetone when distilled. Free acetone is never present in urine.—W. D. H. (*J. C. Soc.*).

ENDOCRINE SYSTEM

960. La tiroidectomia en los caballos. B. A. Houssay and E. Hug (*Rev. del Inst. Bacteriol. del Dep. Nac. de Higiene*, 1920, **11,** No. 5).—Thyroidectomy in young horses caused a delay in body growth (size of body, sexual organs, teeth, etc.) and sometimes death in a few months. Adult horses did not present any apparent perturbation. Nearly every thyroidless horse experienced passing hypothermy. In some cases there appeared very prominent œdema, and generally a depression in normal vitality was noticed.—B. A. H.

961. Bocio producido experimentalmente por aguas de la provincia de Salta. B. A. Houssay (*Rev. del Inst. Bacteriol. del Dep. Nac. de Hygiene*, 1920, **11,** No. 5).—Goitre has been produced in rats in Buenos Aires by giving them water from Cerrillos (a northern town affected with endemic goitre) to drink.—B. A. H.

962. Prevalence of Thyroid Enlargement about Hereford. H. E. Durham (*J. Hygiene*, 1921, **19,** 394-401).—In many cases this amounts to goitre. The tendency is readily seen also in the streets by observations on women who nowadays display their neck region freely. Details are added about water supply. No conclusion is reached, but an exhaustive investigation is urged.—W. D. H.

963. Relative Activity of the Thyroid Lobes. N. W. Brown (*Endocrin.*, 1921, **5,** 29-32).—A suggestion that the string galvanometer may be useful to detect differences in secretory activity between the two lobes of the thyroid. Some cases are recorded and records given.—S. V.

964. Changes in the Thyroid following Intoxication by Toxic Protein Derivatives. A. L. Tatum and J. E. Sweet (*Proc. Path. Soc.*, Philadelphia, 1917, **37,** 22).—The thyroids of animals killed by obstruction of the duodenum or by intravenous injection of material found in the intestinal loops were studied histologically. There was frequent rupture of alveolar walls with passage of colloidal material into the extra-acinar tissue; desquamation of the epithelium with enlargement of certain cells; and hyperæmia. The parathyroids and thymus were normal.—S. V. (*Endocrin.*).

965. The Glucose Mobilisation Rate in Hyperthyroidism. B. J. Sanger (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 117-20).—Six normal persons and 8 cases of hyperthyroidism were studied. After a preliminary fast each was given a standard dose of glucose. In all the 8 cases of hyperthyroidism there was an original increase in the total metabolism of 30% or over, as compared with the normals, and in all but 1 case there was an increase in the carbohydrate metabolism, shown by the high respiratory quotient and the calculated amount of carbohydrate burned. The evidence is considered to indicate that the liver has a decreased ability to demobilise carbohydrate from the blood stream or that perhaps there is a hypermobilisation rate.—D. H. de S.

966. Weight of the Thyroid and Thymus in Man. R. E. Scammon (*Anat. Rec.*, 1921, **21,** No. 1).—The variability in weight of the thymus and thyroid in normal young adults is very great. The weights show a slight negative correlation in early maturity. The weights in the new-born also vary greatly, but show a slight positive correlation. The conclusions of Dustin and Zunz as to the value of this data as evidence of a functional correlation between the thymus and thyroid are not substantiated.—W. D. H. (*W. I.*).

967. La glande thyroïde et les anomalies de métamorphose chez les anoures. C. O. Jenson (*Compt. rend. soc. biol.*, 1920, **83,** 948-9).—The duration of the tadpole stage depends on the degree of development of the secretory powers of the thyroid, and the more active the thyroid the earlier the metamorphosis.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

968. Diet and Thyroid. R. Tsuji (*Acta Schol. Med.*, Kyoto, 1920, **3**, 713-28).—Rats on vitamin-free diet cease to grow. The thyroid atrophies and its hypofunction leads to changes in other organs. The ovary and testis and serous acini of digestive glands waste and degenerate; mucous acini are unaffected. Thyroid feeding causes hyperplasia of the serous, but not of mucous acini. Liver cells decrease in size, but their granules increase; thyroid feeding causes decrease of granules and of glycogen; the adrenals lose weight.—W. D. H.

969. Adenoma of the Thyroid with Hyperthyroidism. W. M. Boothby (*Endocrin.*, 1921, **5,** 1-20).—The syndrome associated with hyperthyroidism from adenoma is distinguishable from that occurring in true exophthalmic goitre. In the former there is increased basal metabolic rate excited by an excess of the normal thyroid hormone. The symptoms are nervousness, tremor, tachycardia, loss in strength and weight, and a tendency to hypertension, and later myocardial disintegration. The author's views are supported by careful study of the basal metabolism, but the figures cannot be quoted here.—S. V.

970. Relation of the Adrenal Cortex to Graves' Disease and Myxœdema. G. A. Friedman (*Med. Record*, 1921, **99,** 295-9).—The author suggests that these two diseases are not monoglandular disturbances, but that in Graves' disease there is hyperfunction of the adrenal medulla, and hypofunction of the cortex: the converse is the case in myxœdema. The evidence must be read in the original.—W. D. H.

971. Contributo allo studio delle capsulopatie sperimentali. G. Lucibelli (*Folia med.*, 1920, **6,** 337-43).—Description of the production in rabbits of a condition of suprarenal insufficiency by the removal of the whole of one suprarenal and a portion of the other.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

972. X Rays and the Suprarenal Region in Rabbits. G. P. Grabfield and T. L. Squier (*Arch. int. Med.*, 1921, **27,** 168-74).—A number of inconclusive and unfinished experiments are recorded which had for their object to lessen adrenal activity by destroying adrenal tissue by irradiation with X rays. Further, the object appears to be the possibility of treating high blood-pressure in man by this means. The authors think that the method may prove of service, but their conclusions from the experiments of rabbits are difficult to ascertain from their paper.—W. D. H.

973. Die Bedeutung der Nebennieren für die Pathogenese und Therapie der Krampf. H. Fischer (*Deutsch. med. Woch.*, 1920, **46,** 1437-8).—The author from observations in man, and experiments on animals, considers the adrenal bodies to be indispensable for muscle excitability, and regards cramp as a manifestation of hyperactivity of the adrenals. He recommends partial ablation of these organs as a remedial measure.—W. D. H.

974. Die Venenmuskulatur der menschlichen Nebennieren und ihre functionelle Bedeutung. R. Maresch (*Wien. klin. Woch.*, 1921, **34,** 44-5).—The adrenal veins possess strong muscle fibres which, by contracting, inhibit the flow. Fluctuations of the volume of the suprarenal gland are caused by the contraction of these muscles.—H. W.

975. Die Wirkung des Adrenalins auf das in der Leber gespeicherte Eiweiss. H. Stübel (*Pflüger's Arch.*, 1920, **185,** 74-85).—The granules, staining red with methyl-green-pyronin, which accumulate in the cytoplasm of liver cells of protein-fed rats disappear after subcutaneous injections of adrenaline.—C. L. E.

976. Über inverse Adrenalinwirkung. C. Amsler (*Pflüger's Arch.*, 1920, **185,** 86-92).—Nicotine and ergotamine, in large doses, paralyse the cardiac sympathetic terminals (frog). The action of adrenaline is then found to be inverted, but the normal action

can be restored by atropine. The inverted action is thus supposed to be due to a vagus excitation revealed by throwing its antagonist out of action by the nicotine or ergotamine.—C. L. E.

977. A Comparison of Rectal with Colon Injections of Adrenaline, with Reference to Pressor Effects and to Glycosuria. H. G. Barbour and F. H. Rapoport (*J. Amer. Med. Assoc.*, 1921, **76,** 492-4).—The rise of B.P. in rabbits is greatest when injected into the rectum, but the colon injection engenders more glycosuria.—C. L. E.

978. Der Einfluss des Adrenalins auf die Sekretion des Magensaftes. W. R. Hess and R. Gundlach (*Pflüger's Arch.*, 1920, **185,** 122-36).—Adrenaline produces an inhibition of secretion which is proportional to the amount administered, and irrespective of the state of secretory activity at the time. The effect lasts 15 to 20 minutes according to dose and method of administration (intravenous or intramuscular).—C. L. E.

979. Der Einfluss von Hypophysenextrakt auf die Magensaftsekretion. W. R. Hess and R. Gundlach (*Pflüger's Arch.*, 1920, **185,** 137-40).—The only effect of pituitary extract (given intramuscularly or intravenously) on gastric secretion seems to be a slight inhibition. This shows that histamine, if present, has its usual effect counteracted by some other substance.—C. L. E.

980. Sull' attivita secretiva della preipofisi in gravidanza. A. Gentili (*Lo sperimentale*, 1920, **74,** 286-91).—Investigations on over 100 pituitaries from cows at different periods of pregnancy and from nulliparous animals. The anterior lobe increases progressively in size from the beginning to the end of pregnancy. The average weight of the hypophysis of nulliparous cows is 135 to 140 mgr., it reaches the 170 mgr. at the beginning of a first pregnancy, increasing up to 350 mgr. at the end. In cows of the same body-weight, but multiparous, the weight of the pituitary body may increase from 310 up to 460 mgr. This means that in proportion to the body-weight that of the hypophysis grows from 1: 100,000 in nulliparous cows to 1: 50,000 at the end of pregnancy in multiparous animals. The anterior lobe in pregnant cows forms excellent material for the study of the so-called gravidic cells, the chief function of which appears to be the secretion of a progressively increasing amount of lipoid substances (phosphatides). Another feature of the anterior lobe during pregnancy is the production of large quantities of colloid material, with the secretion of which the chromophobe cells appear to be chiefly concerned.—C. d. F.

981. The Hypophysis Cerebri of the Woodchuck (*Marmota monax*). A. T. Rasmussen (*Endocrin.*, 1921, **5,** 32-66).—The hypophysis is described in detail. The whole gland forms 0·000235% of the gross body-weight. Pars anterior forms 46%, pars intermedia 2·46%, and pars nervosa over 50% of the organ. It is 13% larger in the male. This sex difference is especially noticeable in pars intermedia, which is 50% larger in the male than in the female. Hibernation produces no modification as compared with the pre-hibernating condition. Immediately after waking up in the spring, during the rutting season, the gland enlarges one-third and the basophilic cells of pars anterior triple in relative number and are more specific in their staining reaction. Hypertrophy and hyperplasia occur independent of the food factor, since weeks of absolute inanition during the active spring season does not appear to prevent their occurrence.—W. D. H. (*W. I.*).

982. Experimentelle Beiträge zur inneren Sekretion der Hypophysis cerebri der Glandulæ parathyroidæ. G. Izumi (*Mitt. a. d. Hyg.-Inst. u. d. Path.-Anat. Inst. Zurich*, 1920).—A study of the histological changes occurring in the pituitary after the removal of the parathyroids shows that the pituitary changes occurring after thyroidectomy are, in reality, due to parathyroid deficiency. Feeding on excess of calcium will not counterbalance the effects of parathyroidectomy on the skeleton. There seems to be no well-marked antagonism between thyroids and parathyroids in the production of tetany, and a previous castration is also without effect.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

983. Die physiologisch-chemische Wirkung des Follikelsaftes. H. Wintz (*Arch. f. Gynäkol.*, 1920, **113,** 457-71).—"Luteolipoid," a hormone prepared from the well-developed corpus luteum, has actions opposite to those displayed by "lipanin," which is obtained from the gland in its earlier stages. For example, the former tends to suppress, the latter to facilitate, menstruation. Neither preparation has an effect on the blood-pressure.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

984. Studien über die von einzelnen Organen hervorgebrachten Substanzen mit spefizischer Wirkung—V. E. Abderhalden and W. Brammertz (*Pflüger's Arch.*, 1921, **186,** 265-71).—Corpus luteum extracts (opton) raise the oxygen consumption of tadpoles. Ovarial extracts otherwise have no effect. Various yeast extracts also raised the metabolism.—C. L. E.

985. Geschlechtsspezifische Wirkungen von Keimdrüsenextrakten. A. Weil (*Pflüger's Arch.*, 1920, **185,** 33-41).—Subcutaneous ox testis extracts (=30 grm. fresh organ per kg.) cause, in sexually immature male, castrated and pregnant female guinea-pigs, at first a sudden fall and then a rise of CO_2 output; adult males and females are unaffected. Ovarian extracts have no effect on adult males, but in other individuals cause a slight fall in CO_2 output. Both extracts also cause typical effects on the nervous system and a rise of body temperature.—C. L. E.

986. Über die Einwirkung des Milzextraktes (Lienins) auf die Tätigkeit des Froschherzens in situ und des isoliertdurchströmten Säugetierherzens. E. Rothlin (*Pflüger's Arch.*, 1920, **185,** 111-21).—Aqueous or alcoholic spleen extracts, histamine and pituglandol have similar actions on the heart, which suggests that histamine may be the active principle of the other two.—C. L. E.

987. Dystrophia Adiposogenitalis. F. G. Ebaugh and R. G. Hoskins (*Endocrin.*, 1921, **5,** 21-8).—A boy of 16 weighing 162 lbs. with psychic infantilism and marked fatiguability. During a period of 6 months he was treated with pituitary, thyroid, and suprarenal gland. At the end of this time there was a striking change for the better in all respects. The authors are not sure how far the beneficial effect was due to suggestion and, if it was due to the gland substance, they incline to the view that it was the pituitary which did good.—S. V.

REPRODUCTIVE SYSTEM

988. Beiträge zur vergleichenden Physiologie der Spermatozoen—I. E. Gellhorn (*Pflüger's Arch.*, 1920, **185,** 262-80).—Experiments were made on spermatozoa of the guinea-pig, frog, and Echinus. The effect of various cations were investigated, and it was found that the spermatozoa of Echinus behaved differently from the others—*e.g.*, in being benefited by Ca, K, and Sr, as well as by Mg; this is perhaps due to the adaptation to sea-water. Carbonate and bicarbonate are more beneficial than NaOH of the same [H]. Pure isotonic NaCl is toxic; alkali prolongs life and accelerates movement. Various endocrine digests (optones) and drugs were also tried with variable results.—C. L. E.

989. Sur les corrélations entre les caractères sexuels mâles et les divers éléments du testicule chez les amphibiens (Étude sur Triton alpestris). C. Champy (*Compt. rend.*, 1921, **172,** 482-4).—The development of the nuptial dress (parure de noces) in Triton follows upon the appearance of spermatozoa in the testis. The theory of Ancel and Bouin does not apply to all vertebrates.—J. A. M.

990. Sur le processus meiotique dans la spermatogenèse de la salamandre et du triton. A. Dehorne (*Compt. rend.*, 1921, **172,** 480-1).—In the formation of spermato-

cytes from spermatogonia part of the chromosomes is transformed into achromatic substance. The original must be consulted for details.—J. A. M.

991. Études expérimentales sur la fonction du corps jaune. J. Nåslund (*Upsala Läk. Förhandl.*, 1921, **26,** 1-24).—A preliminary notice of experiments on rabbits, from which at present the only definite conclusion which is drawn is that injection of large amounts of extract of corpus luteum in early stages of gestation arrests the process.—W. D. H.

992. Biologia della placenta. S. Piccoli (*Arch. ostetr. e ginecol.*, 1920, **8;** reprint, pp. 158).—The biological activities of the placenta are reviewed and discussed, but in particular the absorption of nitrogenous substances, carbohydrates, and mineral salts is dealt with. In the maternal and fœtal blood there appear to be contained normally about the same amount of amino-nitrogen. If the amino-N is artificially increased in the maternal blood, a similar increase occurs in the fœtal blood, but a return to the normal equilibrium soon takes place, the amino-acids being absorbed in part by the maternal, in part by the fœtal tissues. The placenta of the dog contains normally about 0·03% of amino-N, and during the passage of the amino-acids it retains very small quantities, which are notably smaller than those absorbed by the muscles and liver of the fœtus. Maternal amino-acids pass probably unmodified through the placenta. A proteolytic or proteosynthetic function of the placenta to the advantage of the fœtus appears neither necessary nor probable, the proteolytic enzymes of the placenta having very likely a limited action, simply connected with local metabolism. The same conclusions apply to the absorption of carbohydrates and mineral salts, and very likely also to that of fats. The general conclusion is that the essence of the exchanges between mother and fœtus probably consists in a process of diffusion.—C. d. F.

993. Das Schicksal des väterlichen chromatins im Kreusungsexperiment. G. Hertwig (*Arch. f. mik. Anat.*, 1920, **94,** 288-302).—An essay dealing with the fate of the paternal chromatin in crosses between organisms of varying degrees of systematic relationship. The general theme is that the more widely separated the parental organisms, the less is the share taken by the chromatin of the male gamete in the building up of the nuclei of the resulting offspring.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

994. Differential Survival of Male and Female Dove Embryos in Increased and Decreased Pressures of Oxygen. A Test of the Metabolic Theory of Sex. O. Riddle (*Proc. Soc. Exp. Biol. and Med.*, 1920, 18, 88-91).—Sex appears to be a factor in survival. Males best survive increased pressures of oxygen; females best survive decreased pressures and cooling.—D. H. de S.

995. Effects of Increased and Decreased Pressures of Oxygen on Dove Embryos. O. Riddle (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 102-5).—Compared with hatched young or adults, the dove embryo has very inferior powers of adjustment to either high or low oxygen pressures. The age of the embryo is the most important factor in its capacity to survive an altered pressure of oxygen. It is probable that the sex of the enclosed embryo and variations in the permeability of the egg-shell to gases are additional factors.—D. H. de S.

996. Evidence for Sex-Linked Lethal Factors in Man. C. C. Little and M. Gibbons (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 111-5).—Statistical evidence indicates the presence of sex-linked lethal factors in man.—D. H. de S.

MILK

997. Nachweis von Kuhmilch in Frauenmilch. G. Kappeller and A. Gottfried (*Münch. med. Woch.*, 1920, **67,** 813-4).—The characters relied on are: (1) The refractive index of the whey; and (2) the consistency of the casein.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

998. Catalase Content of Milk. A. Machens and F. Cordes (*Milch. Zentr.*, 1921, **50,** 25-7).—Two similar bottles are connected at their shoulder by a short tube fitted with a three-way tap; at the bottom of one bottle is a tubulure which is connected with a vertical graduated tube. This bottle is filled with water so that the level of the latter is at the zero mark on the tube; 15 c.c. of milk are placed in the other bottle, both are closed with stoppers, and the whole apparatus is placed for 15 minutes in an oven heated at 37°, the three-way tap being turned so as to place both bottles in communication with the atmosphere; 5 c.c. of 1% hydrogen peroxide are then added to the milk, the tap is turned to place the bottles in communication with each other, and the apparatus is kept at 37°. The evolution of gas increases the pressure in the apparatus, and this pressure is indicated by the water rising up the graduated tube.—W. D. H. (*J. C. Soc.*).

PHARMACOLOGY

999. Recent Tendencies in Chemotherapy. H. H. Dale (*Proc. Roy. Soc. Med.*, 1921, **14,** Sect. of Ther. and Pharm., 7-15).—Presidential address, in which the author treats the subject with numerous illustrations of drug action in his usual illuminating manner. The concluding sentences run: "The tendency to regard chemotherapy as a field for the organic chemist and to eliminate the pharmacologist is premature. . . . Brilliant with promise in its beginning, chemotherapy seems to have reached a point where its successes are the result of luck and empirical trial; nothing but fuller knowledge can give us that rational basis of theory from which scientific progress can result."—W. D. H.

1000. Heliotherapy in the High Alps. A. Rollier (*Lancet*, 1921, i., 582-5).—A very remarkable series of cases illustrating the value of sunlight as a cure for various ailments. An editorial in the *Lancet* calls attention to the difference of opinion on the value of light (ultra-violet, etc.), and urges renewed research in the action of light on the human body.—W. D. H.

1001. Influence of Colloids on the Action of Non-Colloidal Drugs—I. W. S. Van Leeuwen (*J. Pharm. Expt. Ther.*, 1921, **17,** 1-20).—In case of the fat-soluble narcotics, the relation between the concentration and action of the drug is constant, and can be represented by a straight line. For a number of drugs not soluble in lipoids, but easily soluble in water, especially for the salts of alkaloids and other basic poisons, the relation of concentration to action is represented by a parabola. The adsorption of dyes by animal charcoal is represented by a parabola, and the object of this research is to afford evidence that adsorption phenomena are of importance in the processes of defence of animal tissues against alkaloids (pilocarpine). It is shown that the adsorption of pilocarpine by animal charcoal follows a similar curve to that of dyes, and that the neutralising action of rabbit's serum on pilocarpine is a physical process, for the pilocarpine can be easily recovered from the serum. There is also some evidence that the pilocarpine is rendered inactive by rabbit's serum in a way similar to the adsorption of this drug by animal charcoal. While the isolated organs of a rabbit are very sensitive to pilocarpine, the animal itself is 3 to 4 times more resistant to this drug than the cat, and it is thought that this resistance is due to the power of secondary receptors to adsorb pilocarpine and prevent its action on dominant receptors.—E. M.

1002. The Anæsthetic and Convulsant Effects of Gasoline (Petrol) Vapour. H. W. Haggard (*J. Pharm. Expt. Ther.*, 1920, **16,** 401-4).—The following symptoms were produced successively in dogs exposed to varying strengths of the vapour: Signs of discomfort, convulsions, immobility, unconsciousness, death; 245 parts in 10,000 of air are fatal. It is pointed out that the toxic effects of gasoline in exhaust gas are much less than those dependent on the CO that may be present.—E. M.

1003. Administration of Carbon Dioxide after Anæsthesia and Operation. S. P. Reimann, G. H. Bloom, and H. A. Reimann (*J. Amer. Med. Assoc.*, 1921, **76,** 437-40).—CO_2 was administered to patients by the apparatus described by Henderson, Haggard, and Coburn (Abstract No. 3601, Vol. V., p. 569). It is concluded that the practice is contra-indicated, but that bicarbonate is indicated in certain cases.—C. L. E.

1004. The Antiseptic Action of Some Aromatic Fumes. D. I. Macht and W. M. Kunkel (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 68-70).—The fumes of gums, spices, and various samples of incense exerted an antiseptic action on the bacteria studied.—D. H. de S.

1005. Mercury Saligenin, a New Antiseptic. A. D. Hirschfelder, M. C. Hart, and F. J. Kucera (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 77-9).—Solutions of this compound possess about the same antiseptic power as mercuric chloride.—D. H. de S.

1006. Astringency and Protein Precipitation by Masked Tannin Compounds. T. Sollmann (*J. Pharm. Expt. Ther.*, 1921, **17,** 63-104).—This paper is a description of an investigation made to test the properties of many tannin preparations placed on the market to check diarrhœa. The object aimed at by such preparations is that they ought to be insoluble while in the stomach, and only develop a continuous astringent action in the intestines. Several methods of testing astringency are described, including one whereby red blood-corpuscles are made resistant to the laking action of water. As regards tannin-protein preparations they are only slowly soluble, and can be but slightly astringent in the stomach. Their action would increase in the duodenum, and continue with the cleavage of the undissolved proteinate. Tannin-acetyl esters are too varied in their composition, and often contain free tannin. The best are but slightly soluble and astringent in acid solution, but bicarbonate dissolves and hydrolyses them slowly, so that their astringency extends into the lower intestines. The paper contains many other details as regards astringent action.—E. M.

1007. Elimination of Phenolsulphonephthalein in Acute Mercuric Chloride Intoxication. W. de B. MacNider (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 73-7).—When normal dogs are given mercuric chloride in the dose of 4 mgs. per kilogram diuresis develops, and there is an increase in the elimination of phenolsulphonephthalein. Prior to, or associated with, the appearance of albumin alone, or albumin and casts in the urine, there occurs a reduction in the reserve alkali of the blood, not primarily a retention phenomenon. There is a reduction in the blood urea associated with the development of degenerative changes in the liver.—D. H. de S.

1008. Die Abführwirkung des Schwefels. Die Abführwirkung des Kalomels. Die Abführwirkung des Phenolphthaleins. A. M. M. v. d. Willigen (*Pflüger's Arch.*, 1921, **186,** 173-84, 185-92, 193-9).—Experiments on cats by X-ray methods. (1) When sulphur is administered, H_2S is formed in the large intestine, and so stimulates its movements that the absorption of water in the proximal colon is much reduced. No H_2S is found in the blood or expired air, and the secreting and absorbing capacities of the mucosa of the intestine are unaltered. (2) Calomel hastens the movements of contents along both small and large intestines, and has little effect on secretion or absorption. (3) Phenolphthalein stimulates the movements of the colon, and to a lesser extent those of the small intestine. There was no effect on secretion or absorption.—C. L. E.

1009. Chemotherapy. IV. The Relative Therapeutic Value of Arsphenamine and Neoarsphenamine. C. Voegtlin and H. W. Smith (*J. Pharm. Expt. Ther.*, 1921, **16,** 449-62).—The trypanocidal activity of the drugs tested was determined by finding the minimal effective dose which drives all, or nearly all, the trypanosomes (*Tr. equierpdum*) from the blood of similarly infected rats. Six different brands of arsphenamine had approximately the same trypanocidal activity, but there was slightly greater variation in the samples of neoarsphenamine tested. There appeared to be no relation between

toxicity and trypanocidal action of arsphenamine and neoarsphenamine. The study of the action of aliphatic arsenicals confirmed the fundamental principle previously formulated from observations on the aromatic arsenicals, that the trivalent oxides are the only forms of arsenic which exert a direct action upon protoplasm. Cacodylic acid does not possess any trypanocidal action even in lethal doses, while methyl and ethyl arsenic acid show a parasiticidal action only when used in doses approaching the lethal dose.—E. M.

1010. Azione comparata dell' avvelenamento acuto da vari composti arsenicali. E. Menegletti (*Arch. di Sci. Biol.*, 1920, **1**, 273-330).—Experiments were made with arsenic trioxide, sodium-hydrogen arsenate, and atoxyl. Intravenous injections of increasing quantities of As_2O_3, starting with a dose somewhat larger than the smallest which may still be fatal, allow rabbits to survive for some days until a dose is reached beyond which the smallest increase kills the animals in a few minutes or hours. Intravenous injections of As_2O_3 are immediately followed by symptoms of acute poisoning. Na_2HAsO_4 acts at first in the same way, but when larger doses are reached the periods of survival vary greatly. Death is not so rapidly produced as with As_2O_3. Injected intravenously, symptoms of acute poisoning do not occur. Death is never caused suddenly even by the use of very large doses of atoxyl, but acute symptoms follow its intravenous injection. The fatal doses correspond to 0·0037 gm. of As per kg. of body-weight in the case of As_2O_3 and Na_2HAsO_4, and to 0·0720 gm. in the case of atoxyl.—C. d. F.

1011. Beiträge zur Kenntnis vom Schicksal des Morphins im tierischen Organismus —II. K. Tamura (*Mitt. der. med. Fak. Univ.*, Tokyo, 1920, **23**, 189-217).—In the Japanese water-frog (*R. nigromaculata*) the increased reflex excitability and tetanus induced by morphine injections may last for several days; this effect appears more slowly, but is always more marked and more prolonged, at low than at high (room) temperatures. Nitrosomorphine, and especially its split products, have not such a prolonged action as the hydrochloride. The author finds that the above results further substantiate his view on the subject—namely, that the excitatory stage of morphine poisoning is due, not to the alkaloid itself, but to the products of its oxidation (see Abstract No. 1231, Vol. V., p. 195).—R. K. S. L.

1012. The Effect of Morphine upon the Alkali Reserve of the Blood of Man and Certain Animals. H. Gauss (*J. Pharm. Expt. Ther.*, 1921, **16**, 475-84).—Subcutaneous administration of morphine sulphate to rabbits, dogs, and sheep increased the alkali reserve of the blood-plasma. There was a slight effect also on the P_H of the blood-plasma. The alkali reserve of the lamb was lower than that of the sheep, and morphine increased it also in this animal. The effect in rabbits was greater than in dogs and sheep. A therapeutic or slightly toxic dose ($\frac{1}{4}$ to $\frac{1}{2}$ grain) in man did not have any effect upon the P_H or alkali reserve when given subcutaneously. Excitement in dogs and rabbits decreased the alkali reserve of the blood-plasma.—E. M.

1013. The Action of Optical Isomers. VII. Hyoscines and Hyoscyamines. A. R. Cushny (*J. Pharm. Expt. Ther.*, 1921, **17**, 41-61).—Ordinary hyoscine (*l*-tropyl-*dl*-oscine) was compared with King's dextrorotatory *d*-tropyl-*dl*-oscine, and *l*-hyoscyamine with *d*-hyoscyamine. The *l*-hyoscine acted about 15 to 18 times as strongly as the *d*-hyoscine in antagonising the action of pilocarpine on the salivary glands and the isolated bowel, while they had identical effects on unstriated muscle, the myoneural junctions in striated muscle, and the central nervous system of the frog. The two hyoscyamines showed the same difference in activity; *d*-hyoscine and *d*-hyoscyamine are more slowly destroyed in the tissues than the corresponding lævorotatory forms, and *d*-hyoscyamine has a late stimulant effect on the frog's spinal cord, which is apparently due to some decomposition product. It is suggested that the specific effects of the atropine group arise from the

physical properties of some chemical compounds formed with an optically active substance in the tissues, while the less specific action may be explained by the properties of the uncombined alkaloid.—A. R. C.

1014. A Pharmacodynamic Analysis of Cocaine Action on the Cerebrum. D. I. Macht and W. Bloom (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 81-2).—Cocaine exerts a depressant action on the intelligent behaviour of albino rats. In no case was there a primary stimulation noted. The various components into which the cocaine molecule can be split up, when injected individually or as a simple mixture with each other, have practically no effect on the behaviour of the rats.—D. H. de S.

1015. Antagonistic Action of Adrenaline to Certain Drugs upon the Tonus of the Terrapin Auricles—V. C. M. Gruber (*J. Pharm. Expt. Ther.*, 1921, **16,** 405-14).—Nicotine in small doses (0·03 to 0·05%) did not increase the general tonus or tonus waves of terrapin auricles, but increased the height of contractions. With stronger solutions (0·1 to 1%) there was an increase in general tonus and tonus waves. The effect of digitalis (0·3 to 0·5%), which was to increase the tonus and tonus waves, was neutralised, as was that of nicotine, by adrenaline. $BaCl_2$ also caused an increase in rate of general tonus and tonus waves, and in this case adrenaline antagonised the tonus waves but did not affect the general tonus to the same extent.—E. M.

1016. The Action of Caffeine, Theobromine, and Theophylline on the Mammalian and Batrachian Heart. R. St. A. Heathcote (*J. Pharm. Expt. Ther.*, 1920, **16,** 327-44).—In suitable dilutions these drugs accelerate and augment the heart-beat in frogs and rabbits. They also cause an increased coronary output, probably by acting as vasodilators of the coronary vessels. The question as to whether the increased coronary flow can be due to the greater activity of the heart muscle is discussed, and the fact that there is no direct relation between coronary output and rate and amplitude of the heart-beat is brought forward as negativing this idea. Caffeine has the weakest action on the coronary flow, and theobromine the strongest. The use of theobromine in angina pectoris is suggested.—E. M.

1017. Tincture of Digitalis and the Infusion in Therapeutics. S. Weiss and R. A. Hatcher (*J. Amer. Med. Assoc.*, 1921, **76,** 508-12).—Digitalis infusions were found to have more constant activity than the tincture, and represented all the activity of the leaves.—C. L. E.

1018. Influence of Cod-Liver Oil and Butter on the Retention of Calcium and Phosphorus. S. V. Telfer (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cv).—It was found that these fats do not specifically affect Ca and P retention. The experiments were carried out on a child of 8 months. Tables are given.—E. P.

1019. Sur les propriétés pharmacodynamiques de quelques éthers-sulphures halogénés. A. Mayer, H. Magne, and L. Plantefol (*Bull. de la soc. de chim. biol.*, 1921, **3,** 9-43).—The authors studied the effects produced by di-brom-ethyl sulphide, di-chlor-ethyl sulphide, and di-brom-propyl sulphide. They found that these substances have similar effects on the system. They produce irritation of the skin, with vesication, and finally gangrene; their action on the eye is similar, irritation and inflammation of the conjunctiva, cornea, and lacrimal apparatus being especially marked. They produce congestion and œdema in the lungs and respiratory passages, the terminal condition resembling a broncho-pneumonia. They also exert a general irritant and toxic effect, producing convulsions, leucocytosis, hypersecretion in the glands of the intestinal tract, and grave disturbances of general metabolism.—E. P.

1020. Beiträge zur Pharmakologie der Lipoide. I. Versuche an roten Blutkörperchen. A. Jarisch (*Pflüger's Arch.*, 1921, **186,** 299-317).—The resistance of red cells to hæmolysis by hypotonic NaCl solutions is increased by emulsions of alcoholic or ethereal tissue extracts, and by small traces of narcotics or soaps; the same treatment reduces their

resistance to acids, alkalis, $HgCl_2$, desoxycholic acid, heat, freezing, and saponin. The explanation suggested is that in the first case the permeability of the corpuscle to water is lowered, while in the second case there is a synergism, *e.g.*, between the action of soap or narcotic and the hæmolytic agent.—C. L. E.

1021. The Effect of the "Emmenagogue Oils" on the Human Uterus. J. W. C. Gunn (*J. Pharm. Expt. Ther.*, 1921, **16,** 485-90).—After hysterectomy for uterine disease, movements of the uterus and Fallopian tubes were recorded by Kehrer's method. Emmenagogue oils (oils of pennyroyal, savin, and tansy) had no action on the uterus and Fallopian tubes. In large doses they caused relaxation and inhibition of movement. Any abortifacient action they may have must therefore be indirect. and possibly due to severe irritation and congestion.—E. M.

1022. Chronic Intoxications on Albino Rats. III. Acetic and Formic Acids. T. Sollmann (*J. Pharm. Expt. Ther.*, 1921, **16,** 463-74).—Acetic and formic acids added to the drinking-water of rats behaved quantitatively alike. Concentrations of 0·01 to 0·25%, corresponding to daily dosage of 0·2 c.c. of acid per kilogram of body-weight, produced no effect on growth, appetite, or consumption of fluid. With concentrations of 0·5% and daily dosage of 0·36 c.c. of absolute acid per kilo of rat, the appetite and growth, but not the fluid consumption, were immediately and progressively diminished with both acids. The reputed diuretic effect of formates and acetates is not due to their acid radicles.—E. M.

1023. A New Diet for Gastric Ulcer. W. Coleman (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 43-4).—Rectal injections of glucose are given throughout the treatment (3 or 4 weeks), and for the first 3 to 5 days nothing is given by the mouth; then olive oil, and shortly after egg albumin in addition, are given. The results have been satisfactory.—D. H. de S.

1024. A Substance Toxic to Guinea-Pigs in the Blood of Infants with "Intestinal Intoxication." O. M. Schloss (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 101-2).—The blood of infants with a type of intestinal intoxication may show the presence of a substance toxic to guinea-pigs. No evidence is available to indicate the nature of this substance or its relation to the disease.—D. H. de S.

1025. Acidosis from Capillary Poisons. G. B. Wallace and E. J. Pollini (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 115-7).—Capillary poisons were found to cause acidosis. Damage to the liver and intestine failed to induce acidosis, and the kidney appeared also not to be a necessary factor in its production. The authors believe that the condition essential is an injury to the muscle capillaries.—D. H. de S.

PATHOLOGY

1026. Anaphylaxis and Immunity in Vitro. H. H. Dale and C. H. Kellaway (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxliii-iv).—The difference between anaphylaxis and immunity (Weil, Dale) depends on the distribution of antibody. In anaphylaxis it is predominant in the cells, and its union with injected antigen causes the shock. In immunity the antibody predominates in the blood, and fixes the antigen before it reaches the cells. The correctness of this view, as opposed to other theories, can be shown by an experiment *in vitro* with the uterus of a sensitised guinea-pig. Antibody in the muscle cells render them acutely sensitive to the antigen, but excess of antibody in the fluid bathing them protects them from the antigen, though they are still sensitive.—W. D. H.

1027. Les phénomènes d'anaphylaxie chez les microbes. C. Richet, Mlle. E. Bachrach, and H. Cardot (*Compt. rend.*, 1921, **172,** 512-4).—The lactic acid bacillus grown

in a medium containing a small amount of thallium nitrate is rendered more sensitive to the action of thallium nitrate. It shows the phenomena of anaphylaxis. This must be regarded as a property common to all living cells; they are rendered more sensitive to a poison by a small previous dose of the same poison.—J. A. M.

1028. Tension superficielle et choc anaphylactique. A. Lumière (*Compt. rend.*, 1921, **172,** 544-6).—The author adheres to his original view, and disagrees with Kopaczewski's theory that the action of sodium hyposulphite in preventing shock is due to an effect on surface tension (see Abstracts Nos. 3661 and 3599, Vol. V., pp. 568 and 578; see also No. 1031 below).—J. A. M.

1029. Désensibilisations et resensibilisations à volonté chez une malade anaphylactisée à l'antipyrine. F. Widal and P. Vallery-Radot (*Compt. rend.*, 1921, **172,** 414-8).—Observations were made on a woman suffering from diabetes, who had been in the habit of taking antipyrin frequently on account of migraine, but who had not used the drug for 5 years. A dose of antipyrin led to the occurrence in a few minutes of redness and swelling of the right upper lip, followed by the appearance of a vesicle a few hours later. If the dose was repeated some days later, exactly the same result followed, and this result was invariable. If, however, the patient took 1 gm. of antipyrin daily for some days, she became desensitised, and the anaphylactic phenomena ceased to occur. If no antipyrin was given for 2 days, a subsequent dose produced slight anaphylactic symptoms in the lip. If the interval was more prolonged, a dose of antipyrin produced more severe symptoms. The observations were repeated again and again with the same results.—J. A. M.

1030. Condition of the Capillaries in Histamine Shock. A. R. Rich (*J. Exp. Med.*, 1921 **33,** 287-98).—Direct examination of the mesentery capillaries during life showed no change when histamine was injected, because exposure brought about a maximal dilatation of all the vessels. By fixation of the mesentery without previous exposure, however, it was found that histamine injections (but not local application) produced dilatation of capillaries and venules, both visible and occult. A slowing of the blood-stream occurred when "shock" was produced.—C. L. E.

1031. Le rôle de la tension superficielle dans les phénomènes du choc. W. Kopaczewski (*Compt. rend.*, 1921, **172,** 337-9).—Reviewing the recent work of Lumière and Chevrotier (Abstract No. 3661, Vol. V., p. 578), the author concludes that reduction of surface tension plays the most important part in the prevention of shock by sodium hyposulphite. The effect is probably due, not to dispersal of flocculi already formed, but to the prevention of flocculation in the plasma (see No. 1028 above).—J. A. M.

1032. Estudios experimentales sobre la accion preventiva y curativa del suero normal de caballo en la infeccion e intoxicacio. R. Kraus and A. Sordelli (*Rev. del Inst. Bacteriol. del Dep. Nac. de Higiene*, 1920, **11,** No. 5).—Normal horse serum contains diphtheria antitoxin. This serum has a protective and a curative action against experimental infection and intoxication (rabbits) strictly proportional to its antitoxic value. In normal serum, as in the immune serum, the antitoxins are found in the pseudoglobulins. The albumins have no efficiency in this direction.—B. A. H.

1033. Leucocytolysis. I. I. Manoukhin (*Lancet*, 1921, i., 685-7).—Leucocytolysins are produced by the spleen, and antileucocytolysins by the liver. The former are set free by exposing the spleen to X rays; they pass into the blood and dissolve leucocytes, a process necessary in combating many diseases. The blood also, in these circumstances, contains excess of bacteriolysins, agglutinins, etc. From experiments on monkeys and guinea-pigs, the author passed on to man, and now reports favourable results in tubercle, tetanus, typhoid, etc., by irradiation of the spleen.—W. D. H.

1034. Über neue Körper mit bisher unbekannter Wirkung in menschlicher Serum. M. Mandelbaum (*Münch. med. Woch.*, 1920, **67,** 1229-32).—The author has demonstrated

the existence in human serum of a substance which, when taken up by cells, has the power of destroying complement in fresh guinea-pig serum. The substance is found in the globulin fraction of the serum, and arises when this is incubated at 37° C. The substance is a thermo-labile colloid, possibly the precursor of amboceptor.—J. H. B.

1035. Ventilation and Massive Infection. S. R. Douglas and L. Hill (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxxx).—Open windows lessen massive infection.—W. D. H.

1036. Preparations from Cases of Epidemic (Lethargic) Encephalitis. C. da Fano (Proc. Physiol. Soc., 1921, *J. Physiol.*, **54,** cxiv).—In these cases, in sections stained by Nissl's method, small granular bodies are seen in the bodies of the nerve cells; these bodies are usually accompanied by pigment. Similar bodies have been seen in a salivary gland of an acute case of the disease.—E. P.

1037. Physiological Differences in Transplantable Tumours. L. C. Strong and C. C. Little (*Proc. Soc. Exp. Biol. and Med.*, 1920, **18,** 45-8).—From a comparison of the changes in size of histologically identical tumours inoculated into the same mice or mice of the same stock, it is concluded that the tumours possess different physiological reactions, and that the causes that determine susceptibility to transplantable tumour tissue lie in the genetic constitution of the individual.—D. H. de S.

1038. L'action d'arrêt du foie sur l'acide urique exogène. Chauffard, P. Brodin, and Grigaut (*Compt. rend.*, 1921, **172,** 477-9).—The amount of uric acid in the blood of the portal vein of the dog was compared with that in the hepatic vein by the method of Folin and Denis. (Polyphenols were found to be absent.) In fasting animals and in those fed on milk there was no difference in uric acid content in the two vessels. But in dogs fed on meat, and especially in those fed on liver and spleen, the portal vein contained considerably more uric acid than the hepatic vein. It is suggested that gouty conditions are due to the failure of the liver to carry out its normal function of arresting imports of uric acid from the digestive tract.—J. A. M.

1039. Studies of the Acid Base Equilibrium in Disease from the Point of View of Blood Gases. J. H. Means, A. V. Bock, and M. N. Woodwell (*J. Exp. Med.*, 1921, **33,** 201-22) —Pressure-volume diagrams of the blood CO_2 show that in compensated acidosis (*e.g.*, in diabetes) there is a rapid return to normal on fasting and increasing salt and water intake. A nephritis with decompensated acidosis was converted to a decompensated alkalosis by administration of bicarbonate; alkali treatment is thus only indicated in decompensated cases, and should be regulated so as to avoid alkalosis. In pneumonia there was a condition of carbonic acidosis due to inadequate ventilation. In anæmia the dissociation curve was higher (more alkaline) than normal.—C. L. E.

1040. Signs of Calcium Deficiency. A. H. Stheeman and A. K. W. Arntzenius (*Nederlansch. Tijdschr. voor Geneesk.*, 1920, **64,** 1030-9).—Among the effects of calcium deficiency, tetany, intestinal insufficiency, etc., are always to be observed. The exaggeration of Erb's reaction for the sensitiveness of the peripheral nerves is particularly well marked.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1041. Phosphaturie und organische Nervenkrankheiten. L. Dünner (*Berl. klin. Woch.*, 1920, **57,** 608-9).—In a case of purulent meningitis marked excretion of phosphates and of calcium was observed during the 2 days preceding death.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1042. Über die Erfolge und das wirksame Prinzip der Organextrakttherapie bei Menstruationsstörungen. P. Esch (*Zentrabl. f. Gynakol.*, 1920, **44,** 561-8).—The treatment of disorders of menstruation by intramuscular injections of extracts of various organs (ovary, corpus luteum, hypophysis) seems to be a non-specific protein therapy. The specific nature of the organ extract has yet to be proved.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1043. Bence-Jones Proteinuria. W. Walters (*J. Amer. Med. Assoc.*, 1921, **76**, 641-5).—A report of 3 cases, with metabolic studies. The significance in relation to myelomata is confirmed. The quantity of the protein excreted is independent of the protein intake, and therefore of diet. Only a little less of the protein is excreted during the night as compared with the day. Traces were identified in the bronchial secretion.—C. L. E.

1044. Beobachtungen über Eiweisszerfallstoxikosen. H. Pfeiffer (*Wien. klin. Woch.*, 1921, **34**, 69).—Certain resemblances are drawn between the effects of parenteral protein cleavage and the effects of intense light on mice. The chief resemblance seems to be that the body temperature falls; in the illness due to light, the effects can be abolished by warming the animal.—H. W. (C. L. E.).

PLANT PHYSIOLOGY

GENERAL

1045. Nouvelles remarques sur la coexistence de deux variétés de mitochondries dans es végétaux chlorophylliens. A. Guilliermond (*Compt. rend. soc. biol.*, 1920, **83**, 1046-9).—Two kinds of mitochondria are present in plant cells (*e.g.*, tulip). One sort are concerned in the development of plastids, and form starch grains or pigment carriers in old cells; the other sort are small grains of unknown function.—W. S.

1046. A propos d'un travail récent de Guilliermond. R. Dubois (*Compt. rend. soc. biol.*, 1920, **83**, 1051-2).—A claim of priority in comparing mitochondria with leucites.—W. S.

1047. Über die Bedeutung der ektotrophen Mycorrhiza für die höheren Pflanzen. L. Rexhausen (*Beitr. z. Biol. d. Pflanzen*, 1920, **14**, 19-58).—Roots of plants associated with ektotrophic mycorrhiza were examined microchemically in their natural habitat. The conclusion is drawn that such mycorrhiza are to be regarded as osmotically active organisms through which food materials are led to the higher plant.—W. S.

1048. Zur Biologie und Physiologie der Schutzstoffe höheren Pflanzen. N. Pastchovsky (*Naturw. Woch.*, 1920, **19**, 497-506).—Critical review.—W. S.

1049. Der Spaltöffnungsapparat von Brugmansia und Rafflesia. H. Cammerloher (*Österr. bot. Zeitschr.*, 1920, **69**, 153-64).—The whole stomatal apparatus is reduced, a fact correlated with the parasitic mode of life and the climatic factors of tropical rain forest where risk of excessive transpiration is not great. The uses of the stomatal apparatus are discussed.—W. S. (*Ber. ü. d. ges. Physiol.*).

PHYSICAL AND CHEMICAL

1050. On the Relationship between Freezing-Point Lowering, $\triangle$, and Specific Electrical Conductivity, K, of Plant Tissue Fluids. J. A. Harris, R. A. Gortner, and J. V. Lawrence (*Science*, N.S., 1920, **52**, 494-5).—Practically no relation was found between the concentration of ionised electrolytes and of total solutes in the leaf tissue fluids of plants of the glacial moraines of Long Island.—W. S.

1051. On Carrageen, Chondrus crispus. P. Haas and T. G. Hill (*Ann. Appl. Biol.*, 1921, **7**, 352-62).—A preliminary general account of carrageen, including notes on its physical and chemical properties.—C. W.

1052. Die kunstliche Zelle. R. Kolkowitz (*Ber. deut. bot. Ges.*, 1920, **38**, 136-40).—A small glass apparatus for experiments on osmotic pressure, etc.—V. H. B.

1053. Die Plasmabewegung verursacht durch eine geordnete Wärmebewegung von Molekülen. A. Meyer (*Ber. deut. bot. Ges.*, 1920, **38**, 36-43).—Protoplasmic circulation

is the result of a change of the irregular movement of the molecules in a region of cytoplasm into a regular movement. Curves of the relation with temperature of (*a*) the rate of cytoplasmic movement in the *Chara* cell, and (*b*) the velocity of the directed kinetic movement (gerichteten Wärmebewegung) of the molecules show fairly close agreement. —V. H. B.

1054. Über die Herstellung von Gelatinefarbfiltern für physiologische Versuche. E. G. Pringsheim (*Ber. deut. bot. Ges.*, 1919, **37,** 184-6).—Directions are given for combining aniline dyes with gelatine, so as to make various light filters by which, alone or in combination, almost any part of the spectrum can be isolated.—V. H. B.

1055. Über die Einwirkung farbigen Lichtes auf die Farbung von Cyanophyceen. K. Boresch (*Ber. deut. bot. Ges.*, 1919, **37,** 25-39).—Only a few members of the Cyanophyceæ show the "chromatic adaptation" described by Gaidukov in 1903. The author has found that *Phormidium foveolarum*, which is normally olive-brown or olive-green, becomes bright green in red and orange-red light, violet behind blue glass, and in yellow light retains its normal colour. The alteration in colour is due to the production of different modifications of phycocyanin.—V. H. B.

1056. Zum Nachweise von Lipoiden in Pflanzenzelle. F. Czapek (*Ber. deut. bot. Ges.*, 1919, **37,** 207-16).—By saturating with Sudan III. a solution containing pyridine and a tertiary amyl alcohol (amylenhydrat), a solution is obtained which fixes well and brings out very clearly the lipoid contents of the cell. The preparations are examined in glycerine.—V. H. B.

1057. Amyloid in jugendlichen Pflanzenorganen als vermuthliches Zwischenprodukt bei der Bildung von Wandkohlenhydraten. H. Ziegenspeck (*Ber. deut. bot. Ges.*, 1919, **37,** 273-8).—The occurrence of amyloid (which stains blue directly with iodine) in the cell walls, especially of the sieve tubes, of many plants is described, and its relation to other substances of the cell wall is briefly discussed.—V. H. B.

1058. Untersuchungen über Fluorescenz und Zustand des Chlorophylls in lebenden Zellen. K. Stern (*Ber. deut. bot. Ges.*, 1920, **38,** 28-35).—In order to investigate fluorescence satisfactorily the spectroscope should be employed. Chlorophyll fluoresces only in actual solution, in colloidal solutions, and in the solid state only very slightly. If a watery colloidal solution of chlorophyll from *Chlorella* be shaken up with some lipoid material (oleic acid, lecithin, cholesterin, etc.), a marked fluorescence appears similar to that which is to be observed in living *Chlorella*. The conclusion is drawn that in the living cell the chlorophyll exists in lipoid solution. As all lipoid solutions of chlorophyll show no particles under the ultramicroscope, the chlorophyll in the living cell is in true solution. Attempts to observe an increase in the fluorescence of living *Chorella*, when assimilation was stopped by urethane, were unsuccessful.—V. H. B.

1059. A Chemical Investigation of the Loganberry. M. R. Daughters (*Oregon Agric. Expt. Stat. Bull.*, 1918, **151**).—Citric acid is the chief acid of the loganberry.—C. W.

1060. The Hygroscopicity and Hydrological Importance of Mosses. L. Piccioli (*Staz. sper. ital.*, 1919, **51,** 312-5).—Contains analysis of ash of a moss.—W. S. (*Chem. Abstr.*).

1061. Action des hydracides sur l'essence de Juniperus oxycedrus. Chlorhydrate, bromhydrate, iodhydrate de cadinène. R. Huerre (*Bull. soc. chim. biol.*, 1920, **2,** 239-46).—Chemical details.—W. S.

1062. Reduction of Nitric Acid in Green Cells. O. Warburg (*Naturwiss.*, 1920, **8,** 594-6).—*Chlorella vulgaris*, Beyerinck, would not reduce nitrates in concentrated solution, but in mixtures of nitrate and free nitric acid (N/100 HNO_3, N/10 nitrate) 50% of the HNO_3 was reduced in the dark and 3 times this amount of NO_3 in the light.—W. S. (*J. C. Soc.*).

ENZYME ACTION

1063. Über ein Kohlenstoffketten knüpfendes Ferment (Carboligase) C. Neuberg and J. Hirsch (*Biochem. Zeit.*, 1921, **115,** 282-310).—Various races of yeast have the power, when actively fermenting, of converting benzaldehyde into optically active *a*-hydroxypropiophenone through combination with acetaldehyde. The substrate may be sucrose, glucose, or pyruvic acid. Press juice or fresh yeast is unable to effect this combination in the absence of fermentation. On account of this property of building up carbon chains the ferment is called " carboligase."—H. K.

1064. The Secretion of Invertase by Plant Roots. L. Knudson (*Amer. J. Bot.*, 1920, **7,** 371-9).—Canada field peas and maize were grown in nutrient solutions. When these contained sucrose, the reducing sugars present in the solution increased. This is regarded as due to excretion from the roots.—W. S.

1065. Influence of Fluctuating Barometric Pressure on the Course of Alcoholic Fermentation and of Biological Processes in General. A. Rippel (*Cent. f. Bakt.*, II., 1916, **47,** 225-9).—In some cases high barometric pressure corresponds with low rate of fermentation, and *vice versa*.—W. S. (*J. C. Soc.*)

GERMINATION AND DORMANCY

1066. Über einige physiologische Wirkungen des Osmiumtetroxyds. R. Seeliger (*Ber. deut. bot. Ges.*, 1920, **38,** 176-84).—Wheat grains are little sensitive to solutions of " osmic acid " up to 0·5%, while the cells of red beet are killed in much weaker solutions; the germination of the grains is, however, delayed. The osmic acid is taken up particularly by the coleoptide, root, and root sheath.—V. H. B.

1067. The Floral Biology of the Peach Tree—II. A. Manaresi (*Staz. sper. ital.*, 1919, **52,** 42-68).—Experiments are described to determine the germinating power of peach pollen in solutions of various sugars in different concentrations.—W. S. (*Chem. Abstr.*).

VEGETATIVE DEVELOPMENT

1068. Die Wachstumkurve. A. Rippel (*Ber. deut. bot. Ges.*, 1919, **37,** 169-75).—The equation of Robertson is considered more satisfactory than that of Mitscherlich in its application to the growth curves of plants.—V. H. B.

1069. Über Form und Darstellung der Wachstumskurven. O. Schuepp (*Ber. deut. bot. Ges.*, 1920, **38,** 193-9).—A consideration of the various formulæ to express the rate of growth put forward by the author, and by Robertson, Mitscherlich, Blackman, etc.—V. H. B.

1070. Some Remarks on the Methods formulated in a Recent Article on " The Quantitative Analysis of Plant Growth." R. A. Fisher (*Ann. Appl. Biol.*, 1921, **7,** 367-72).—Criticises the methods put forward in 2 recent articles on " The Quantitative Analysis of Plant Growth."—C. W.

1071. Methods in the Quantitative Analysis of Plant Growth. A Reply to Criticism. G. E. Briggs, F. Kidd, and C. West (*Ann. Appl. Biol.*, 1921, **7,** 403-40).—A reply to the above criticism.—C. W.

1072. Über das Schicksal des Chlorophylls bei der herbstlichen Laubverfärbung. R. Kolkwitz (*Ber. deut. bot. Ges.*, 1919, **37,** 2-5).—A number of examples are given which are against Stahl's view that the major part of the green pigments of crude chlorophyll are passed back into the stem when the leaves take on their autumn colouring.—V. H. B.

1073. Die Färbung der Laubblätter und ihre Änderung im Laufe des Sommers. O. Meissner (*Naturw. Woch.*, 1920, **19,** 518-22).—Discussion of this subject.—W. S. (*Ber. ü. d. ges. Physiol.*).

1074. Die Pflanze im Wechsel der Jahreszeiten. H. Schroeder (*Naturw. Woch.*, 1920, **19,** 52-9).—It is necessary to distinguish between numbness ("Starre") and rest. —W. S. (*Ber. ü. d. ges. Physiol.*).

1075. Die Einfluss der Nährstoffe auf die Qualität der Kartoffel. A. Kraft (*Forschungsinst. f. Kartoffelbau*, 1920, Heft 3).—Commercial potash manures, when applied singly, are usually toxic to the potato on account of the chloride they contain. Manuring only with nitrogenous manures increased the protein, but decreased the ash content; the plants grow well and are dark green. The influence of phosphates depends on the concentration and form of the lime presented to the plant. Stable and green manure influence the potato favourably.—W. S. (*Ber. ü. d. ges. Physiol.*).

1076. Recherches biochemiques experimentales sur le rôle physiologique des glucosides chez les végétaux. I. Etude préliminaire. R. Combes (*Rev. gén. de bot.*, 1917, **29,** 321-9, 353-64; 1918, **30,** 5-15, 33-49, 70-92, 106-24, 146-56, 177-204, 226-37, 245-69, 283-300, 321-32, 355-65).—The first 7 instalments consist of a review of work published previously on the subject. The remainder describes in detail methods of culture, and the results of experiments with various plants grown with saponin and with amygdalin added to the culture solution. The general conclusions arrived at are as follows: Saponin from *Agrostemma* has a harmful effect on plants other than *Agrostemma*. The root development and dry weight production is much reduced by addition of the glucoside. Amygdalin in culture media, whether purely mineral and deprived of nitrogen, or including nitrogen, or including nitrogen with the addition of glucose, exercises a harmful effect on the plants even when such plants produce cyanogenetic glucocides themselves. In the cases investigated the saponin and amygdalin were not taken up by the plants.—G. E. B.

GROWTH OF LOWER PLANTS

1077. L'acclimatation de la levure de bière à l'arsenic. J. Effront (*Compt. rend. soc. biol.*, 1920, **83,** 806-7).—By gradual acclimatisation brewer's yeast can be made to tolerate 3 times the concentration of arsenic that originally would have proved fatal, the yeast producing a substance (H_2S in the case of some races) which inhibits the action of the arsenic.—W. S.

1078. Sur le mécanisme de l'acclimatation des micro-organismes aux substances toxiques. J. Effront (*Compt. rend. soc. biol.*, 1920, **83,** 807-9).—The acclimatising of micro-organisms to poisons depends on the production of a substance which removes the poison (*cf.* preceding abstract).—W. S.

1079. Production de périthèces chez un aspergillus sous l'influence d'une bactérie. A. Sartory (*Compt. rend. soc. biol.*, 1920, **83,** 1113-4).—A species of *Aspergillus* cultivated on banana did not produce perithecia in pure culture, but did so on the addition of a pure culture of a bacterium.—W. S.

1080. Die Bildung löslicher Stärke im elektiven Stickstoff-Stoffwechsel. F. Boas (*Ber. deut. bot. Ges.*, 1919, **37,** 50-6).—*Aspergillus niger* produces soluble starch from saccharose, dextrose, or maltose with 5% ammonium chloride if the P_H is 2·25, 1·85, and 1·57 respectively, and the temperature 32° to 33° C. By the use of iodine the intensity of soluble starch can be roughly determined, and thus give a guide to the hydrogen-ion concentration of the solution. By this means it was determined that if a number of nitrogenous compounds are available, the fungus absorbs the more highly dissociated one even when the resulting products are strongly poisonous.—V. H. B.

1081. Bemerkungen über konidienbildende Stoffe bei Pilzen. F. Boas (*Ber. deut. bot. Ges.*, 1919, **37,** 57-62).—Conidia formation in *Aspergillus niger* is largely dependent on the nature of the substratum. Maltose and raffinose give conidia in large quantities,

dextrose, levulose, and saccharose much less. With nitrogenous substances like acetamide, glycine, urea, and asparagine the effect on conidia production appears to vary directly with the degree of dissociation of the substance.—V. H. B.

1082. Selbstvergiftung bei Aspergillus niger. F. Boas (*Ber. deut. bot. Ges.*, 1919, **37,** 63-5).—The author has previously described the death of *Cladosporium*, which may be brought about by the production of ammonia when it is growing on a medium containing urea. A similar alkalinity of the medium with the production of ammonia and amines is to be observed when *Aspergillus niger* grows on a medium containing maltose (5%) and urea (2%).—V. H. B.

1083. Über die Zuchtung von Pilzen auf hochkonzentrierten rohrzuckerhaltigen Nährböden und über die Chondriomfrage. N. Bezssonof (*Ber. deut. bot. Ges.*, 1919, **37,** 136-48).—A preliminary notice dealing with the effect of strong cane-sugar solution in favouring the development of the sexual organs of *Penicillium*, *Aspergillus*, and *Rhizopus*.—V. H. B.

1084. Über die Bildung organischer Säuren durch Aspergillus niger. F. Elfving (*Öfversigt af Finska Vetenskaps- Soc. Förhandl. A. Math. o. Naturw.*, 1918-19 [publ. 1920], **61,** No. 15, 23 pp.).—This fungus did not develop on pure solutions of glucose or sucrose, but if a sheet of the fungus is presented with such a solution, and if free oxygen is present, much oxalic acid is formed which is later in part used again. The fungus behaves similarly on solutions of lactose, mannite, inulin, dextrin, glycerin, peptone, and asparagin. The acid formation is increased by rendering the solution alkaline, and it is significantly greater at a higher than at a lower temperature. On a complete nutrient solution with NH_4Cl or $(NH_4)_2SO_4$ as source of N, oxalic acid does not collect. Ammonium salts of different organic acids do not act in this way. Citric acid is also formed, often in greater quantity than oxalic acid; it is used up before the latter. The power of acid accumulation varies with the race of the fungus; there are some which only accumulate citric acid. Ca salts hinder the formation of oxalic acid. The acids are not formed directly from sugar, but by the breaking down of intermediate complex compounds.—W. S. (*Ber. ü. d. ges. Physiol.*).

1085. Attackability of Cis- and Trans-Isomeric Unsaturated Acids by Moulds. P. E. Verkade and N. L. Söhngen (*Cent. f. Bakt.*, II., 1920, **50,** 81-7).—In solution containing excess solid calcium carbonate the acids behave similarly towards *Aspergillus niger* and *Penicillium glaucum*; fumaric, cinnamic, *allo*cinnamic, oleic, and erucic acids are readily assimilated, glutaconic acid slightly, while maleic, citraconic, itaconic, crotonic, isocrotonic, and other acids are not attacked. Almost similar results are obtained with the free acids.—W. S. (*J. C. Soc.*).

1086. Regularities in the Preservation of Wood. Poisoning Action of Inorganic Compounds on Fungi. F. Moll (*Cent. f. Bakt.*, II., 1920, **51,** 257-79).—An investigation of the effect of 130 different salts in various concentrations on cultures of *Penicillium glaucum* growing on peptone agar. The poisonous action of salts is an additive property of the ions. Poisonous ions in order of descending toxicity are: Hg, Ag, Cd, CN, Cu, Zn, Fe, Co, Cr, F. Most acid ions and ions of alkali and alkaline earth metals, Mg and Al, are inactive. Every ion exhibits a specific poisonous action. Addition of other salts to active substances may affect the time course of the action, but does not affect the final result.—W. S. (*J. C. Soc.*).

1087. Reinkulturen von Flechtengonidien. H. Warén (*Öfversigt af Finska Vetenskaps- Soc. Förhandl. A. Math. o. Naturw.*, 1918-19 [publ. 1920], **61,** No. 14, 84 pp.).—On agar containing asparagine, alanine, or glycine as source of N the author succeeded in obtaining pure cultures of the alga constituent of certain lichens. Details of the method of culture and of the appearance and form of growth of the colonies are given. —W. S. (*Ber. ü. d. ges. Physiol.*).

1088. Beiträge zur Beurteilung der Empfindlichkeit der Sauerstoffzehrung und ihrer Beeinflussung durch Plankton und Detritus. A. Müller (*Arch. f. Hyg.*, 1920, **89**, 135-60).—Discusses the oxygen relations of bacteria and phytoplankton.—W. S. (*Ber. ü. d. ges. Physiol.*).

1089. New Methods of Analysis of Hydrocarbons with the Aid of Bacteria. J. Tausz and Marta Peter (*Cent. f. Bakt.*, II., 1919, **49**, 497-554).—Three species of bacteria isolated from garden soil attack different hydrocarbons, and so were able to be used in analysing mixtures of hydrocarbons.—W. S. (*J. C. Soc.*).

1090. The Cultivation of Yeast in Solutions of Purified Nutrients. M. B. MacDonald and E. V. McCollum (*J. Biol. Chem.*, 1921, **45** [2], 307-11).—The authors come to the conclusion that either yeast must grow without " water-soluble B " or it must synthesise that substance to meet its own needs.—G. E. B.

1091. Disinfecting Values of the Three Isomeric Cresols. F. Ditthorn (*Cent. f. Bakt.*, I., 1919, **82**, 483-91).—Title from *J. C. Soc.*—W. S.

1092. Specific Disinfection Processes. II. Action of Salts and Ions on Bacteria. P. Eisenberg (*Cent. f. Bakt.*, I., 1918, **82**, 69-208).—The toxicity of salts may be regarded as an additive function of their component ions, although purely molecular actions are not excluded. The toxicity series of kations varies with the anion, and *vice versa*.—W. S. (*J. C. Soc.*).

1093. Bidrag til Kundskab om 12 Gærarters Assimilationsevne overfor 4 Sukkerarter. A. Klöcker (*Medd. f. Carlsberg Laboratoriet*, 1919, **14**, 1-36).—An investigation on the assimilation of sugars in different kinds of yeast. To determine whether assimilation takes place it is necessary to estimate the increase in living cells. The increase is influenced by many different factors besides the sugar, especially by the source of nitrogen compounds.—B. J.

CROP YIELD

1094. The Influence of Crop Plants on those which Follow—I. B. L. Hartwell and S. C. Damon (*Rhode Island Agric. Expt. Stat. Bull.*, 1918, **175**).—Gives the results of field experiments.—C. W.

1095. The Influence of Crop Plants on those which Follow—II. B. L. Hartwell, F. R. Pember, and G. E. Merkle (*Rhode Island Agric. Expt. Stat. Bull.*, 1919, **176**).—Gives the results of pot experiments and chemical investigations.—C. W.

1096. The Value of Sodium when Potassium is Insufficient. B. L. Hartwell and S. C. Damon (*Rhode Island Agric. Expt. Stat. Bull.*, 1919, **177**).—The results of a field experiment which was begun in 1894 to ascertain the value of sodium as an entire or partial substitute for potassium showed that where there was an insufficiency of potassium sodium was generally useful for the growth of plants.—C. W.

1097. Vegetationsversuche mit physiologischen Reaktionen. E. A. Mitscherlich (*Landw. Jahrb.*, 1919, **54**, 477-92).—The relation between the plant yield and the amount of nutrient, such as nitrogen, depends upon the acidity or alkalinity of the culture medium, and consequently upon the form in which the nutrient is supplied. Mitscherlich's logarithmic equation does not hold for all cases.—G. E. B.

1098. The Influence of Calcium and Magnesium on the Growth of Plants. T. Pfeiffer and A. Rippel (*J. Landw.*, 1920, **68**, 4-39).—When the CaO/MgO ratio is reduced to 1/9, the lessened yield is not due to the toxicity of excess of Mg, but to lack of CaO. Increased MgO absorption did not lead to increased absorption of P_2O_5.—W. S. (*Chem. Abstr.*).

1099. Versuche über die Wirkung normaler und besonders grosser Gaben verschiedener Stickstoffdünger als Kopfdünger zu Wintergetreide. L. Hiltner and F. Lang (*Landw. Jahrb. f. Bayern*, 1920, **10**, 23-38).—Results of different manuring on crop yield of winter rye and wheat are recorded.—W. S. (*Ber. ü. d. ges. Physiol.*).

ASSIMILATION

1100. Sulla formazione dell' amido nelle piante verdi. C. Ravenna (*Atti R. Accad. Lincei, Rendiconti*, 1920, [5] **29** [i.], 148-50).—Polemical against Pollacci.—W. S.

1101. A New Theory of Carbon Dioxide Assimilation. P. R. Kögel (*Z. wiss. Bot.*, 1920, **19,** 215-23).—See Abstract No. 2280, Vol. IV., p. 362.—W. S.

1102. Organic Carbon Nutrition of Plants. Parallels between Fungi and Green Plants. T. Bokorny (*Cent. f. Bakt.*, II., 1917, **47,** 191-224, 301-75).—A summary of observations on the use of a number of organic substances by fungi and green plants.—W. S. (*J. C. Soc.*).

1103. Possible Formation of Hexamethylenetetramine in Assimilating Plants and a Microchemical Reaction for Ammonium Salts. C. van Zijp (*Pharm. Weekblad*, 1920, **57,** 1345-8).—Title from *J. C. Soc.*—W. S.

WATER RELATIONS

1104. Zur Kenntniss der Gewebespannungen. O. Schuepp (*Ber. deut. bot. Ges.*, 1919, **37,** 217-23).—Observations on the tension of tissues, chiefly those of the flower-buds of *Lathyrus*. The various curvatures can be fixed by warming in water to a temperature between 55° and 60° C.—V. H. B.

1105. Die Saugkraftleistungen abgeschnittener, transpirierender Sprosse. M. Nordhausen (*Ber. deut. bot. Ges* , 1919, **37,** 443-9).—A defence against Renner's criticism of the method devised by the author for the measurement of the absorbing power of cut shoots.—V. H. B.

1106. Zur Kenntniss der Saugkraft—III. A. Ursprung and G. Blum (*Ber. deut. bot. Ges.*, 1919, **37,** 453-62).—A study of the absorbing power of the various cells of the cut leaf of *Hedera helix* allowed to dry in the air. In most cells the absorbing power increases, as is to be expected, but in the palisade cells far removed from the veins it remained constant, in spite of the fact that the osmotic pressure of the cells, as measured by plasmolysis, had increased by 37%.—V. H. B.

1107. The Ecological Significance of the Abscission Tissue in the Branches of Ephedra. P. Greguss (*Botanikai közlemények*, 1920, **18,** 1-16; Hungarian).—The abscission of branches in *Ephedra* in late autumn is to reduce transpiration to a minimum.—W. S. (*Ber. ü. d. ges. Physiol.*).

1108. On the Meteorological Factors of the Transport of Water. J. Szolnoki (*Botanikai közlemények*, 1920, **18,** 20; Hungarian).—From Poiseuille's formula for viscosity the author deduces the influence of temperature and humidity, and shows that the plant in the transport of water performs mechanical work like a heat engine.—W. S. (*Ber. ü. d. ges. Physiol.*).

IRRITABILITY AND MOVEMENT

1109. Experimentelle Untersuchungen über Regeneration des Gipfels und Kontaktempfindlichkeit bei Windepflanzen. B. Löffler (*Ber. deut. bot. Ges.*, 1919, **37,** 6-24).—A continuation of the author's earlier (1913) work, in which he showed that twining plants of *Banisteria*, *Drosenea*, etc., were sensitive to contact, since after loss of the apex the buds below behave differently according to their position away from or against the support. This observation is now extended to a number of other genera and species. The difference in behaviour is not due to differences of light intensity.—V. H. B.

1110. Über den Einfluss geringer Lichtmengen auf die Zuwachsbewegung der Koleoptile von Avena sativa. H. Sierp (*Ber. deut. bot. Ges.*, 1919, **37,** 123-8).—Vogt has reported that the "light-growth-reaction" (on which Blaauw's theory of phototropic response

depends) is not observed when a lesser amount of light is given than 3,840 metre-candle-seconds, though much smaller amounts give a phototropic reaction. The author finds that the reaction of Blaauw is obtained with quantities as low as 10 m.c.s., though it differs from the reaction obtained with 2,000 m.c.s.—V. H. B.

1111. Die Bedeutung der Lichtrichtung für den Phototropismus. H. Lundegårdh (*Ber. deut. bot. Ges.*, 1919, **37,** 225-36).—A preliminary account of some experiments with the coleoptile of *Avena* in favour of the "light-direction" theory of the nature of the phototropic reaction.—V. H. B.

1112. Neue phototropische Fundamentalversuche. J. Buder (*Ber. deut. bot. Ges.*, 1920, **38,** 10-19).—A preliminary account of experiments in relation to the phototropic problem of light direction or light contrast. A sporangiophore of *Phycomyces* growing *in water*, when illuminated in the ordinary way, does not curve, as the difference in intensity of the two sides is too small, but if a pencil of light illuminates one longitudinal half of the organ it will curve in a plane *at right angles* to that of the direction of the light. If the whole organ is illuminated there is no curvature. Illumination by various pencils of light falling from above on one side of the apex of the coleoptile of *Avena* causes curvatures independent of the direction of the light. An illumination also of the hollow coleoptile from inside and from outside gave similar curvatures, although the direction of the light is reversed. The direction hypothesis is inconsistent with the modern view that the curvature is due to photochemical processes. The experiments of Lundegårdh (see abstract above) are not consideredsatisfactory.—V. H. B.

1113. Zur reizphysiologischen Analyse der postfloralen Krummungen des Blütenstiels von Tropæolum majus. F. Oehlkers (*Ber. deut. bot. Ges.*, 1920, **38,** 79-83).—A preliminary account. The curvature is due to a combined reaction to light and gravity due to an alteration of sensitiveness which appears at the time of fertilisation, but is unconnected with it.—V. H. B.

1114. Zur Kenntniss der tropistischen Krümmungen bei Lebermoosrhizoiden. H. Langer (*Ber. deut. bot. Ges.*, 1919, **37,** 262-72).—The rhizoids of *Marchantia* and *Lunularia* show a positive geotropic reaction which, however, can be abolished by the negative phototropism in feeble light. The rhizoids of *Lunularia* are positively aerotropic, and show also a chemotropic reaction (positive or negative according to concentration) to KNO_3 and glucose, and a positive reaction to asparagin and tyrosin, and a negative reaction to $CaHPO_4$.—V. H. B.

1115. Über den Einfluss von Licht und Feuchtigkeit auf die Wachstumsrichtung des Lebermoosgametophyten. H. Buch (*Öfversigt af Finska Vetenskaps- Soc. Forhandl. A. Math. o. Naturw.*, 1918-19 [publ. 1920], **61,** No. 10, 8 pp.).—Spp. used were *Lophozia binsteadii* and *L. polychyroleuca*. In dried air and with the thallus growing on a damp substratum the stream of water vapour from the latter conditions the growing apex to lie flat on the ground, thus exhibiting transversal hydrotropism. After a continuance of such one-sided humidity, or in very damp air, light exerts the principal directive action, the shoots being positively phototropic. Neither gravity nor contact with the under side exerts any effect on the direction of growth in presence of light under such conditions.—W. S. (*Ber. ü. d. ges. Physiol.*).

1116. Untersuchungen über den Thermotropismus der Pflanzen. R. Collander (*Öfversigt af Finska Vetenskaps- Soc. Forhandl. A. Math. o. Naturw.*, 1918-19 [publ. 1920], **61,** No. 11, 95 pp.).—See Abstract No. 2291, Vol. IV., p. 364.—W. S.

FLOWER AND FRUIT FORMATION

1117. Über die Beziehung der Aufblühzeit und des Sitzes der Blüte am Rispenaste zum Korngewichte des Reises. Y. Yamaguchi (*Ber. des Ohara Inst.*, 1919, 451-517).—From the results of numerous experiments with several varieties of rice the author finds that

the heaviest seed generally develops, not from the first flower to open, but from the second, third, or still later flower. For the average weight of the seed which develops from flowers opening on the same day it can generally be said that the earlier the flower opens the heavier will be the seed produced. The correlation between the observed time of flowering and the weight of the seed is negative and poor, but occasionally it is fairly good.—C. W.

1118. Kurze Mitteilung über die Beziehung der Aufblühzeit und des Sitzes der Blüte am Rispenaste zum Korngewichte des Reises. Y. Yamaguchi (*Bot. Mag. Tokyo*, 1920, **34,** 136-9).—A preliminary communication of the results presented in *Ber. d. Ohara Inst. für landw. Forschungen*, 1919, 451-517 (see preceding abstract).—C. W.

1119. Off-Year Apple Bearing and Apple Spur Growth. R. H. Roberts (*Univ. Wisconsin Agric. Expt. Stat. Bull.*, **317,** 1920, 1-34).—Biennial bearing appears to be related to nutritional conditions. Fruit-spurs have a very short growth period, but the flower-buds are formed nearly a year before blossoming. Flower-bud formation also depends upon nutrition. Biennial bearing is related to spur growth; regular bearing to both tree and spur growth. A crop of fruit may be borne when 35% of the spurs blossom. Blossom spur formation on second year wood is important for regular bearing. Pruning has a very marked effect upon spur growth.—C. W.

GENETIC FACTORS

1120. Om den ikke mendlende Arvelighed hos brogetbladede Planter. Ø. Winge (*Medd. f. Carlsberg Laborat.*, 1919, **14,** 1-19).—The author sets up the following scheme with regard to the heredity of "variegated leaf": I. The bases of "variegated leaf" are localised in the nucleus, especially in the chromatin. Such forms segregate according to Mendelian laws, and the character is often recessive in respect to normal green colour. Such are (1) the albino form of Melandrium and Antirrhinum; (2) the citrina form of Antirrhinum and Pelargonium; (3) the chlorina form of Mirabilis, Urtica, Antirrhinum, and Aquilegia; (4) the variegated form of Mirabilis and Aquilegia; (5) the albomarginata form of Lunaria. II. The bases of "variegated leaf" are not localised in the nucleus, but in the cytoplasm, and then either in the plasma itself or in the plastids. No Mendelian distribution. A. The bases are localised in the plastids, wherefore albino forms and normal forms can result. (*a*) On fertilisation the generative nucleus is followed by vital cytoplasm with plastids which pass over into the egg-cell. The character is transmitted through both parents. The only example of this: "Mosaic plants" of *Pelargonium zonale*. (*b*) No cytoplasm with plastids passes over into the egg-cell on fertilisation. Hence only maternal inheritance. Hereto belong the albomaculata form of Mirabilis, Antirrhinum, and Primula. B. The bases are localised in the plasma, wherefore no albino forms nor normal forms result. (*a*) On fertilisation the generative nucleus is followed by vital cytoplasm which passes over into the egg-cell. The character is transmitted through both parents. Hereto belongs only the albomaculata form of Capsicum. (*b*) No cytoplasm passes over into the egg-cell on fertilisation. Hence only maternal inheritance. Hereto belongs only the albomaculata form of Humulus.—B. J.

1121. Institutionen for ärflighetsforskning vid Åkarp. H. Nilsson-Ehle (*Nordisk Jordbrugsforskning.*, 1919, 98-103).—In Åkarp, Scania, Sweden, a new institute for heredity was built in 1918. The director here gives a short account of the problems at which the institute is working, including the following: (1) The aim of many crossing experiments is to obtain plants with a definite combination of character. When the characters are numerous, the possible number of combinations is so great that the type of plant sought for is so sparingly represented among the offspring that the possibility

of finding it may be very difficult. It will be necessary to carry out a selection within the material, and it is a question of great importance how to make this selection as practical as possible. (2) The resistance of wheat against *Heterodera Schachtii*. (3) The heredity of chlorophyll. (4) Mutations. (5) Practical experiments in improving wheat.—B. J.

ENVIRONMENTAL FACTORS

1122. Wirkungen des Lichts verschiedener Wellenlänge auf die Pflanzen. F. Schanz (*Ber. deut. bot. Ges.*, 1919, **37**, 430-42).—A continuation of earlier experiments on the effect of various light radiations on the growth of plants, especially of the effect of cutting off ultra-violet light. Plants were grown in frames : (1) Uncovered; (2) covered with ordinary glass allowing light longer than 320 $\mu\mu$ to pass; (3) with *euphos-a* glass cutting out light of shorter wave length than 380 $\mu\mu$; (4) with *euphos-b* glass absorbing up to 420 $\mu\mu$; (5) with red glass absorbing up to 560 $\mu\mu$; (6) with yellow; (7) with green; and (8) with blue-violet glass. With cucumbers petunias, and a number of other plants, the plants regularly increased in height in the series from 1 to 5, and decreased in height in the series from 6 to 8. The potato and red beet, however, showed a much bigger development in the blue-violet than in the yellow. Fuchsias, beans, and tomatoes flowered earlier under *euphos* glass than under ordinary glass or in the open. The anthocyan pigment of the leaves seems to be dependent on the presence of ultra-violet light, and seeds under *euphos* glass germinated sooner than in the open. The advantages for horticultural purposes of rough glass (rohglas), which is recognised in Holland, is to be explained by the fact that though it absorbs more visible light it also absorbs more of the ultra-violet.—V. H. B.

1123. Die Wasserversorgung der Pflanzen im Winde. Bernbeck (*Naturw. Zeitsch. f. Forst.- u. Landw.*, 1920, **18**, 121-41).—Discussion of the subject indicated in the title. —W. S. (*Ber. ü. d. ges. Physiol.*).

1124. Baumkronenform und Schattenfestigkeit. Rubner (*Forstw. Zentralbl.*, 1920, **42**, 249-58).—Title from *Ber. ü. d. ges. Physiol.*—W. S.

THE SOIL

1125. Om Benyttelse af Mikroorganismer til Bestemmeln af Jordens Indhold af Plantenæ-ringsstoffer, der ev tiljanjelige for hijere Plantes (with English summary). K. A. Bondorff (*Den kgl. Veterinar. z. Landbohojskoles Aarsskrift*, 1918, 339-62).—H. R. Christensen has worked out a method to determine whether or not a soil needs $CaCO_3$. When a solution of mannit is infected with a sample of the soil an azotobacter membrane will develop when the quantity of $CaCO_3$ is sufficient, but not when the soil needs $CaCO_3$. Bondorff proves that the significance of the $CaCO_3$ in this reaction is that it acts as a buffer, keeping the hydrogen-ion concentration near the neutral point, which is a necessary condition for the development of azotobacter. This bacterium is killed when P_H is $< 6{\cdot}7$. He also investigates whether or not it is possible to use the development of *Aspergillus niger* as a measure for the content of phosphates available in the soil. As the character of the soil is altered by sterilisation, he concludes that the method cannot be used.—B. J.

1126. The Soil Reactions of Certain Rock Ferns. E. T. Wherry (*Amer. Fern. J.*, 1920, **10**, 15-22).—The soil reactions were determined by the indicator method. Of 25 species of ferns, 7 grew on acid soils, and the remainder on calcareous soils, but some of both groups could endure soils with an opposite reaction.—W. S.

PATHOLOGY

1127. The Influence of Soil Factors on Disease Resistance. A. Howard (*Ann. Appl. Biol.*, 1921, **7**, 371-89).—The author gives the results of a study which emphasises the important part played by a systematic examination of the root system when investigating the influence of soil factors on disease resistance in various plants.—C. W.

1128. The Plant as an Index of Smoke Pollution. A. C. Ruston (*Ann. Appl. Biol.*, 1921, **7**, 390-402).—Gives the results of an investigation carried out to determine the ways in which plants may be used as an index of atmospheric pollution by coal smoke.—C. W.

1129. Un interessante parassita del lupino non ancora segnalato in Italia: Blepharospora terrestris (Sherb.) Peyr. B. Peyronel (*Atti R. Accad. Lincei, Rendiconti*, 1920, [5] **29** [i.], 194-7).—The fungus is identical with *Phytophthora terrestria*, Sherb., that produces buck-eye rot of tomatoes. The reasons for referring it to the genus Blepharospora are given, and the pathology of the lupin host described.—W. S.

BOOK REVIEWS

Principles of General Physiology. By Professor W. M. Bayliss. Third and Revised Edition. Pp. xxvi, 862, with 261 illustrations. London: Longmans, Green and Co., 1920. Price 28s. net.

It only seems like yesterday that we were reading Professor Sherrington's review of the second edition (Vol. III. of these Abstracts, p. 213). The necessity for a new and revised edition so soon is a subject of hearty congratulation to the author. Anything of the nature of an extensive review is superfluous; a word of welcome is the only note one need sound; for the work, though thoroughly revised and brought up to date, has no new features. It is still a well-remembered friend. The chief addition is a section on the capillary circulation, which has assumed prominence owing to important work recently published on that subject, work in which Professor Bayliss has himself participated. Not the least interesting feature of the new issue is the new preface. The author's prefaces are always refreshing and stimulating reading.—W. D. H.

The Anatomy of the Nervous System. By S. W. Ranson, M.D. 8vo. Pp. 395, figs. 257. Philadelphia and London: W. B. Saunders and Co., 1920.

In this volume, an excellent broadly-treated morphological account of the nervous system, physiologists will find much helpful exposition of the bearings of the anatomical data upon function. The conductive direction and side connections of the neuron chains are kept in view throughout. Their analysis is described and figured with admirable discrimination between the main and the minor points. The book summarises in its later part the chief results as regards the fundamental conduction paths traced by anatomy; in this arrangement it resembles Edinger's text-book, but it is more lucid, and goes further. The descriptions of the neuron composition of the spinal ganglia, of the cerebellum, and of the sympathetic system may be instanced as specially successful. The author is well known for his original studies in the histology of the nervous system, and his present volume bears evidence of his first-hand and critical acquaintance with his subject in all its parts. The illustrations are many and most useful.—C. S. S.

Practical Chemical Analysis of Blood. By Victor C. Myers. Pp. 121. St. Louis: C. V. Mosby Co., 1921.

Under the above title, Professor Myers has collected his seven papers on analytical methods which appeared in *J. Lab. and Clin. Med.* last year, and have all been abstracted in these pages. A few fresh details are added in an appendix. The whole constitutes an admirable practical guide to those interested in analysis of the blood.—W. D. H.

H. K. LEWIS & CO. LTD., 28 GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

1130. Aphasia: Historical Review. H. Head. **Discussion on Aphasia.** H. Head and others (*Brain*, 1920, **43**, 390-411, 412-50).—Most interesting and instructive, but such articles do not lend themselves to abstraction.—W. D. H.

1131. Prenatal Death. A. Robinson (*Edin. Med. J.*, March, 1921; reprint, 40 pp.).—Struthers' Memorial Lecture, 1920. Statistics of matings, production of offspring, abortions, number of corpora lutea, etc., in horses and ferrets, indicate a considerable amount of prenatal death in mammals, and presumably in man. The frequency of the occurrence leads the author to consider it "normal," or at any rate usual, and not necessarily due to pathological changes in the parents. Even abortion is called normal, and the subsequent uterine changes are useful, and not inflammatory or degenerative, though they are regressive. Inability of gametes to unite successfully (incompatibility of parents) is an important factor. The author does not deal with the still greater mortality of gametes before conjugation, to which the word normal seems more appropriate.—W. D. H.

1132. Centre of Gravity in Man. P. M. Dawson and others (Proc., *Amer. J. Physiol.*, 1921, **55**, 312-3).—This was determined by various methods, and the results are stated in terms of measurement. There seems to be a slight sexual difference.—W. D. H.

1133. Daily Analysis for a Year of Outdoor Air. W. M. Boothby and Kathleen Sandiford (Proc., *Amer. J. Physiol.*, 1921, **55**, 294-5).—Slight irregularities in oxygen noted are not considered to represent seasonal variations in city air.—W. D. H.

1134. Der Lebenszustand und seine Aeusserungen. G. F. Lipps (*Schweiz. med. Woch.*, 1921, 97-105).—Theoretical and mathematical considerations.—H. W.

1135. The Application of Certain Physical Efficiency Tests. V. T. Scott (*J. Amer. Med. Assoc.*, 1921, **76**, 705-7).—Schneider's and Crampton's tests are compared, and the reasons for the adoption of the former for the Air Service are given. In bradycardia and in nervous cases the results are liable to be misleading.—C. L. E.

1136. Spells of Rest and Physical Efficiency. P. M. Dawson and Lucy A. Wallrich (Proc., *Amer. J. Physiol.*, 1921, **55**, 314).—Bicycling with heavy weights becomes more efficient with spells of rest. With light weights, continuous riding produced better effects. With training (1 subject) the advantage of rest spells passed off.—W. D. H.

1137. Cardiomuscular Indices. P. M. Dawson and Frances V. Kupperman (Proc., *Amer. J. Physiol.*, 1921, **55**, 314).—Stone's, Tigerstedt's, and Barach's indices were examined in relation to physical efficiency. The results are stated very briefly, and to an outsider ignorant of the meaning of the indices appear very contradictory. It might be useful in writing for physiologists if these writers would explain the terms they use.—W. D. H.

1138. Hours of Work in Relation to Quality of Output. A. H. Ryan and P. S. Florence (Proc., *Amer. J. Physiol.*, 1921, **55**, 315-6).—Three jobs were studied in relation to percentages of scrap (? useless work). They gave different results, which are explained by the number of receptors involved. The results are put too briefly to be intelligible, and no doubt will be studied when they are fully presented by those engaged in the technical study of industrial fatigue.—W. D. H.

APPARATUS AND METHODS

1139. Two New Time Control Instruments. D. A. Laird (*J. Exp. Psychol.*, 1920, **3,** 465-74).—These complex instruments, in which great accuracy is aimed at, cannot be described without the diagrams.—W. D. H.

1140. New Perimeter. A. C. Hudson (*Proc. Roy. Soc. Med.*, Section of Ophth., 1921, **14,** 28-9).—A modified improved form of the ordinary perimeter (figured). It is stated to be expensive.—W. D. H.

1141. Intravenous Injection of Mice, Rats, and Guinea-Pigs. G. B. Roth (*Pub. Health Rep., U.S. Pub. Health Service*, 1921, **36,** 661-5).—A description of the technique employed in the Hygienic Laboratory of the U.S. Public Health Service. Full details and illustrations are given.—J. A. H.

1142. Eubaryt, ein neues Kontrastmittel für Röntgenuntersuchung. E. Lenk (*Münch. med. Woch.*, 1920, **67,** 786).—Description of a barium sulphate preparation for rendering a meal opaque to X rays during radiography of the intestine.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1143. A Simple Method of Counting Blood-Platelets. M. A. van Herwerden (*J. Amer. Med. Assoc.*, 1921, **76,** 723-4).—The principle is to dilute with an urea-NaCl mixture, which hæmolyses the red cells, and then to count by the Thoma-Zeiss method.—C. L. E.

1144. A Simple Artificial Respiration Apparatus. J. W. C. Gunn (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxxiv).—A pneumatic door check was used as a pump, the piston being joined to a crank which is connected to the rotating shafting. A small box with a simple valvular arrangement prevents suction on the lungs of the animal while the pump is filling. The longest stroke of the pump is suitable for a dog; the shortest for a rabbit. The pump was assembled at a cost of under £1. With a small motor the apparatus could be used for class demonstrations. A diagram is given.—I. F.

1145. A Simplified Gas Volumeter for the Use of Students. D. T. Harris (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxii-iv).—Details are given of a simple class method for the determination of oxygen content, capacity, and also CO_2 content of blood. It was designed to enable students to follow the events in the ferricyanide method of Haldane and as a preliminary to the blood-gas manometer of Barcroft.—I. F.

1146. Untersuchungen über I. Bang's Mikromethode zur Bestimmung von Traubenzucker. S. A. Holbøll (*Biochem. Zeit.*, 1921, **113,** 200-9).—A vindication of the principle of Bang's new micromethod.—H. K.

1147. A New Reagent for the Estimation of Sugar in Urine. J. B. Sumner (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxi).—4-6-dinitroguaiacol is reduced to the intensely coloured 4-nitro-6-aminoguaiacol when heated with solutions of glucose in the presence of sodium carbonate. The reaction is quantitative, and lends itself to the colorimetric estimation of glucose. The new reagent is not reduced by other urinary constituents.—J. C. D.

1148. An Improved Form of Barfoed's Reagent. H. E. Roaf (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lx-lxi).—The most satisfactory reagent was found to be: Copper acetate, 50 g.; sodium acetate, 50 g.; glacial acetic acid, 5 c.c.; water to 1,000 c.c. With this reagent a reduction is obtained with 0·1% glucose solution on merely bringing to the boil, whilst pure specimens of 1% maltose or lactose do not show reduction under similar conditions.—I. F.

1149. New Method for the Estimation of Reducing Sugars. A. Jonescu and V. Vargolici (*Bul. Soc. Chim. România*, 1920, **2,** 38-45).—The solution recommended con-

tains 46 g. of potassium ferricyanide and 46 g. of potassium hydroxide in 1 litre. For an estimation, 10 c.c. of this solution is diluted with 20 c.c. of water and heated to boiling, and the sugar solution run in drop by drop until the colour just disappears. The end-point is made clearer if 10 drops of a 1% solution of picric acid are added. The latter reagent in alkaline solution in the presence of a reducing agent is converted into red picramic acid. In estimating sugar in urine, more accurate results are obtained if the urine is first defecated with lead acetate, the lead being subsequently precipitated with sodium carbonate. For the estimation of lactose in milk, the milk is first clarified by means of a 1% solution of picric acid in 2% acetic acid. In all these estimations the concentration of the sugar solution should not exceed 1%. The ferricyanide solution should be standardised against pure glucose, and 10 c.c. should be equal to 0·05 g. of glucose.—W. D. H. (*J. C. Soc.*).

1150. Volumetric Estimation of Lactose by Alkaline Potassium Permanganate. F. T. Adriano (*Philippine J. Sci.*, 1920, **17,** 213-20).—A mixture of 50 c.c. of $N/10$ permanganate solution, 25 c.c. of 0·848% sodium carbonate solution, 10 c.c. of lactose solution (containing about 1·5% of the sugar), and 15 c.c. of water is heated at 95° for 2 minutes; 25 c.c. of 30% sulphuric acid are then added, and the mixture is titrated with $N/10$ oxalic acid solution until the liquid is clear. The excess of oxalic acid is titrated with $N/10$ permanganate solution. The quantity of permanganate used for the oxidation is a measure of the amount of lactose present; the permanganate solution must be standardised against pure lactose. The method may be used for milk after this has been treated with $CuSO_4$, nearly neutralised, and filtered. The results are slightly lower than those yielded by the Soxhlet method.—W. D. H. (*J. C. Soc.*).

1151. Estimation of Calcium and Magnesium in Serum or Plasma. B. Kramer and F. F. Tisdall (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxix-xl).—See Abstract No. 710, Vol. VI., p. 109.—W. D. H.

1152. The Use of Edestin in Determining the Proteolytic Activity of Pepsin. J. F. Brewster (*J. Biol. Chem.*, 1921, **46,** 119-27).—Full details of a useful practical method which appears to yield trustworthy results.—J. C. D.

1153. Zur Methodik der Phosphorsäurebestimmung. Anwendung des Pregl'schen Verfahrens auf die Serumanalyse. S. Wiener (*Biochem. Zeit.*, 1921, **115,** 42-5).—Pregl's method is applicable to the estimation of phosphorus in serum. For estimating the total phosphorus 2 c.c. of serum are sufficient, but for the non-lipoid phosphorus 10 c.c. of serum are precipitated with 90 c.c. of picric acid solution ($\frac{1}{2}$%), and the acid-soluble phosphate estimated in 40 c.c. of the filtrate.—H. K.

1154. Eine Methode zur Bestimmung der Chloride in kleinen Flüssigkeitsmengen. S. Rusznyák (*Biochem. Zeit.*, 1921, **114,** 23-6).—To avoid errors introduced by adsorption of chlorides by precipitates, the author has converted Korányi's macro-method into a micro-method. A known volume of liquid, blood, serum, or urine, 0·11 to 0·13 c.c. is measured by a capillary pipette, treated with excess—*e.g.*, 1·6 c.c. of $N/100$ $AgNO_3$ solution from a microburette, and 10 drops of strong HNO_3 added. The solution is warmed, and simultaneously concentrated potassium permanganate solution is added drop by drop until the colour is permanent on boiling. For serum 3 to 4 drops are required. After 5 minutes' boiling a trace of dextrose is added to decolorise, and the excess of $AgNO_3$ titrated with $N/100$ ammonium sulphocyanide, using ferric alum as indicator. Parallel experiments agree within 2%, and show good agreement with the macro-method. The process is rapid.—H. K.

1155. Über eine Farbenreaktion von Glycinanhydrid und der Dipeptidanhydride, welche eine Glycylkomponente in sich schliessen. T. Sasaki (*Biochem. Zeit.*, 1921, **114,** 63-6).—Jaffé's colour reaction for creatinine is applicable to the above substances if sodium hydrate is replaced by carbonate and the solution heated to boiling.—H. K.

1156. Die Bestimmung der Oxalsäure und der Oxalursäure im Harn und im Kot. A. Bau (*Biochem. Zeit.*, 1921, **114**, 221-57).—The oxalic acid is precipitated as calcium oxalate by addition of calcium acetate. Full details are given.—H. K.

1157. Etude sur la simplification de la méthode de colorimétrique par l'utilisation des matières colorantes. M. Takata (*Tohoku J. Exp. Med.*, 1920, **1**, 460).—Modifications of the following methods are described: Bogert, Folin, and Wu for uric acid in urine; Folin, Cannon, and Denis for adrenaline; Csonka for acetone; Liebermann-Burchard for cholesterol; Harding and Maclean for amino-acids; Folin and Wu for blood-sugars.—R. K. S. L.

1158. A Decalcifying and Dehydrating Fixative. C. E. Jenkins (*J. Path. and Bact.*, 1921, **24**, 166-7).—The tissue is immersed in 100 times its volume of hydrochloric acid 4, glacial acetic acid 3, chloroform 10, water 10, absolute alcohol 73%.—W. E. G.

1159. On Picro-Carmine. V. Jensen (*Brit. J. Exp. Pathol.*, 1921, **2**, 103-4).—The addition of free picric acid to the magnesium picrate and magnesium carmine of P. Mayer leads to improved results in carmine staining. The new mixture may be used instead of picric acid in Claudius' method.—W. D. H.

CHEMICAL

1160. Dispersivity and Surface Phenomenon. W. A. Osborne (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54**, lxxix-lxxx).—When the dispersivity of finely divided matter is equal to that possessed by colloidal solutions, maximal catalytic power is obtained. Assuming that catalysis is causally related to the special qualities of specific surface, and that each molecule at the surface is under a strain caused by the pull of all the other molecules which lie within the range of molecular attraction, it is concluded that the estimation of catalytic power with varying diameter of the colloidal disperse phase would give an indirect method of measuring the range of molecular attraction.—I. F.

1161. Le Chatelier's Theorem in Relation to Reduction of Oxyhæmoglobin, Neutrality Regulation, and Oxidation. H. E. Roaf (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54**, lxiv-vi).—Le Chatelier's theorem states that a reaction which takes place with a change of state is impeded by that alteration. Its relation to acidity is here investigated. It is assumed by analogy with H_2SO_4 and H_2SO_3 that oxyhæmoglobin is more acid than hæmoglobin, and consequently acid should inhibit the formation of oxyhæmoglobin. A study of the effect of acid upon the dissociation curve shows this to be true. Further instances are given, such as the reduction of cupric salts to cuprous by the sugars, which is inhibited by acid, since cupric salts possess stronger basic properties than cuprous. Where oxidation in the tissues is accompanied by increased acidity, that stage will be inhibited by acid, and the removal of acid will be inhibited by alkali. The reverse holds true when oxidation is accompanied by increase of alkalinity. This is a possible explanation of the narrow range of H-ion concentration at which life is possible.—I. F.

1162. Dielektrizitätskonstanten biochemischer Stoffe. R. Keller (*Biochem. Zeit.*, 1921, **115**, 134-58).—A protracted discussion of the various factors related to the dielectric constant of various biochemical substances. The author considers that the electrostatic surface charge of colloids plays an important part in the transport of biochemical substances.—H. K.

1163. Comparative Results with Scales' Method and Devarda's Alloy for Reducing Nitric Nitrogen. A. P. Harrison (*J. Biol. Chem.*, 1921, **46**, 53-6).—The reduction of nitrates by zinc copper couple, as suggested by Scales, is as reliable as by Devarda's alloy, and is more convenient.—J. C. D.

1164. Die Adsorption der Alkalichloride an Tierkohle. H. Hartleben (*Biochem. Zeit.*, 1921, **115,** 46-51).—The adsorption of various alkali chlorides by animal charcoal is approximately the same.—H. K.

1165. Über die Adsorption durch Kohlenstoff. H. Herbst (*Biochem. Zeit.*, 1921, **115,** 204-19).—A discussion of the nature of the adsorption by wood charcoal.—H. K.

1166. Adsorptive Capacity of Fuller's Earth. G. H. A. Clowes, A. L. Walters, and G. B. Walden (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxviii-ix).—The adsorptive capacity for alkaloids appears to be a direct function of the amount of Fe and Al in the Lloyd's reagent, and to be adversely affected by silica. Water loss on heating causes a similar effect.—J. C. D.

1167. The Detection of Volatile Alkylamines in the Presence of Ammonia, and of Volatile Tertiary Alkylamines in the Presence of Volatile Primary and Secondary Alkylamines. H. E. Woodward and C. L. Alsberg (*J. Biol. Chem.*, 1921, **46,** 1-7).—A separation based on a reaction with potassium mercuric iodide is described.—J. C. D.

1168. d-Ribohexosaminic Acids. P. A. Levene and E. P. Clark (*J. Biol. Chem.*, 1921, **46,** 19-33).—The synthesis described in this communication completes the synthesis of the entire series of *d*-hexosaminic acids. Improved directions are given for the preparation of ribose from yeast nucleic acid.—J. C. D.

1169. Zur Chemie der Polysaccharide. M. Samec (*Biochem. Zeit.*, 1921, **113,** 253-4).—Polemical.—H. K.

1170. Über die Mikrochemie der Chitosanverbindungen. B. Hermann (*Biochem. Zeit.*, 1921, **113,** 111-24).—The identity of chitose of different origins is affirmed.—H. K.

1171. Zum Verhalten des Formaldehyds im Tierkorper. E. Salkowski (*Biochem. Zeit.*, 1921, **115,** 159-67).—An account of experiments designed to estimate formaldehyde in presence of alkali by distillation or in presence of egg-albumin. They were unsuccessful.—H. K.

1172. Températures critiques de dissolution des graisses dans les mélanges d'alcool éthylique et amylique. A. J. J. Vandevelde (*Bull. soc. chimique de belgique*, 1921, **30,** 14-6, 58-62).—Data are given in reference to the fats of beef, butter, and coco.—E. Z.

1173. Physico-chemical Method of Characterising Proteins. E. J. Cohn (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** iii-iv).—A method of characterising proteins in terms of their amphoteric constants. Each protein has a different iso-electric point. The H-ion concentration corresponding to this point determines the ratio of the acid (K*a*) to the basic (K*b*) dissociation constants. Data for 6 proteins are given; in these the ratio varies from 1 (gluten) to 250,000 (potato globulin).—W. D. H.

1174. Hydrolysis of Lactalbumin. C. O. Johns and D. B. Jones (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xii).—Proline 2·25, aspartic acid 9·37, glutamic acid 13% were recovered. Considerable amounts of hydroxyglutamic acid are present.—J. C. D.

1175. Beitrage zur physikalischen Chemie der Agglutination. Studien über Eiweissreaktionen—IV. A. v. Szent-Györgyi (*Biochem. Zeit.*, 1921, **113,** 36-41).—Experiments which appear to conform to the electro-chemical theory of agglutination.—H. K.

1176. Combination of Mineral Salts with Organic Colloids and the Condition in Certain Growths. A. Scala (*Ann. d'Ig.*, 1920, **30,** 251-73).—The author has shown previously that acid is liberated by the contact of neutral salts with colloids, such as gelatin, agar-agar, and muscle, in a degree which depends on the nature and the degree of dissociation of the salt and on the properties of the colloid. The phenomenon is attributed to a readier hydrolysis of the amount of the adsorbed salt; if the washing is continued, a neutral and finally an alkaline series of waters are obtained, provided that the base of the salt used is soluble in water; heavy metals are retained by the colloid. The salts of the alkaline earths behave similarly to those of the alkali metals, since their bases are

more or less soluble in water. Aluminium behaves as a heavy metal, since its hydroxide does not dissolve. Union with an insoluble cation does not influence the behaviour of gelatin, and possibly of other colloids, towards salts. The mineral salts in the turnip, potato, radish, cucumber, pumpkin, and parsnip are united to the colloid in the same manner as in the artificial mixtures, and behave in an exactly similar manner when treated with water. The compounds are very stable when preserved in an ice-chest, but are irreversibly changed when warmed at 50° to 70°, so that the acid is very rapidly removed by water. The author considers that undue attention has been paid to the organic components of the extracts in the investigation of accessory food factors, since frequently a very large proportion of the inorganic substances passes into the water, alcohol, and acid. It is possible that a gap is produced in the series of necessary inorganic nutrient substances by the one-sided administration of a certain nutriment. Substances of the hydroxypyridine series may also possibly act as carriers for inorganic materials, which they readily adsorb in alcoholic solution. Antiscorbutin shares the slight stability towards heat of the colloidal salt complexes; the acid components which are liberated on heating readily pass into the wash or boiling waters. The residue can lose bases when further washed, but possibly still contains the anti-beriberi vitamin, which is stable in boiling water. The author considers further that decomposition of the colloid-salt complex is possible under the influence of varying physical and psychic stimuli, thus establishing a connection between the pathology and therapeutics of many diseases, particularly those of neoplasms.—W. D. H. (*J. C. Soc.*).

1177. Chemical and Physical Behaviour of Casein Solutions. J. Loeb (*J. Gen. Physiol.*, 1921, **3**, 547-55).—Experiments on casein confirm the conclusions drawn from those on gelatin and albumin—namely, that the reactions between proteins and acid and alkali are of the same nature as those between crystalloids, being dependent on the valency and not the nature of the ion in question.—W. M. B.

1178. Colloidal Behaviour of Proteins. J. Loeb (*J. Gen. Physiol.*, 1921, **3**, 557-64).—The potential difference between gelatin chloride solutions in a collodion sac and the saline solutions outside is depressed in the same proportion as the osmotic pressure is depressed. If it is assumed that the potential difference is due to differences in H-ion concentration, it is found that the Nernst formula is followed. It is explicable on the lines of Donnan's membrane equilibrium. When acid is added to gelatin, the osmotic pressure reaches a maximum at $P_H = 3{\cdot}5$, and then falls again. The potential difference behaves in the same way. The curves for the potential differences of the sulphate, chloride, phosphate, and oxalate are parallel to those of their osmotic pressure.—W. M. B.

1179. Glycine and Glycyl-Glycine Synthesis. J. L. Morris and F. Deeds (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xii).—Chemical details.—J. C. D.

1180. Estimation of Tryptophan in Proteins. P. Thomas (*Ann. inst. Pasteur*, 1920, **34**, 701-8).—The tryptophan of proteins has been measured by direct isolation and weighing (Hopkins and Cole); by digestion and titration with Br water, a change from red-violet to yellow indicating its complete monobromination (Levene and Rouiller); by the glyoxylic acid colour reaction of Hopkins and Cole; and by a similar method, using *p*-dimethylaminobenzaldehyde (Herzfeld). The author finds the Herzfeld method reliable if certain precautions are followed, the chief of which is to assure complete solution of the protein used. By this method the tryptophan content of casein was found to be 1·7%, a figure about equal to that obtained by weighing.—W. D. H. (*Chem. Abstr.*).

1181. Origin of Melanin from Pyrrole. P. Rondoni (*Lo sperimentale*, 1920, **74**, 157-70).—Experiments with rabbit skin (saline extracts) showed that in the case of black rabbits incubation with a weak pyrrole (A) solution caused slight browning, which

was intensified to a black in the presence of $FeSO_4$, showing no differences from the skin extracts of white or grey rabbits in the presence of this salt. It thus appears that the ability to oxidise A *in vitro* is greater in the case of pigment-forming skins than in those incapable of colour production. While A has some action in increasing the production of pigment in the skin of rabbits *in vivo*, its action is not as great as that of *a*-pyrrole carboxylic acid, whose increased action is ascribed to its slower elimination.—W. D. H.

1182. Über die Oxydation des Cystins und anderer Aminosäuren an Blutkohle. O. Warburg and E. Negelein (*Biochem. Zeit.*, 1921, **113,** 257-84).—In illustration of the theory that oxidation processes in living tissues take place at the boundary surface between the liquid cell contents and the solid structural portion, the authors found that cystine, leucine, and tyrosine suffer more or less oxidation to CO_2 and NH_3 when an aqueous solution is shaken with oxygen in the presence of blood-charcoal.—H. K.

1183. Weitere Beiträge zur Theorie der Invertasewirkung. L. Michaelis (*Biochem. Zeit.*, 1921, **115,** 269-81).—The active mass of invertase, whether in solution or adsorbed on ferric oxide or charcoal, is proportional to its concentration. Invertase adsorbed on ferric oxide is dissolved by sucrose, maltose, raffinose, and serum-albumin, but not by fructose, glucose, mannose, lactose, *a*- and *β*- methyl glucosides. There is no apparent relation between the solvent effect of the sugars and the specific fermenting capacity of invertase.—H. K.

1184. Catalase and Temperature. O. O. Stoland and L. Walling (Proc., *Amer. J. Physiol.*, 1921, **55,** 305).—If catalase is an enzyme, it differs from all other enzymes in showing increased activity at low temperatures such as 0° C. It is only partially destroyed at − 14°, and completely destroyed at 45° to 50°.—W. D. H.

1185. Gibt es Abwehrfermente gegen Polysaccharide ? E. Herzfeld and R. Klinger (*Biochem. Zeit.*, 1921, **114,** 27-32).—By means of a test elaborated in former papers, which will detect 1 mgm. of glucose or maltose as osazone in fluids containing protein, the authors find that the sera of the ox, dog, pig, rat, and horse can produce glucose from starch or glycogen *in vitro*, but the sera of man, guinea-pig, and rabbit lack the power. The general applicability of Abderhalden's defensive ferment theory is disproved by showing that repeated injections of inulin or gum-arabic in the dog or starch and inulin in the rabbit failed to produce ferments capable of splitting these carbohydrates.—H. K.

1186. Enzymes. V. Resistance of Ptyalin to the Action of Hydrochloric Acid in the Presence of Starch. D. Maestrini (*Atti R. Accad. Lincei*, 1920 [v.], **29,** ii., 391-4).—Starch paste protects mixed human saliva from the destructive action of HCl, the highest concentration of the latter which the enzyme is able to withstand for 3 hours without irrecoverable loss of the amylolytic properties being 0·16%. The importance of the substrate for the preservation of the enzymic activity of saliva is hence evident.—W. D. H. (*J. C. Soc.*).

1187. Über die Beziehung von Druck, Temperatur und Fermentwirkung. I. Die Wirkung von Druck auf die Geschwindigkeit der Fermenthydrolysen durch Pepsin, Trypsin und Diastase. S. Frankel and G. Meldolesi (*Biochem. Zeit.*, 1921, **115,** 85-95).—At pressures of 5, 10, and 15 atmospheres of N or CO_2 the rate of hydrolytic action of pepsin, trypsin, or diastase shows a marked increase. There is an optimum pressure, for in the case of each enzyme 5 atmospheres causes a greater acceleration than 10, and 10 than 15. The effect of pressure is thus analogous to the effect of temperature.—H. K.

PHYSIOLOGY OF INVERTEBRATES

1188. Zur Kenntnis der photodynamischen Erscheinung. Die induzierte Phototaxis bei Paramœcium caudatum—II. P. Metzner (*Biochem. Zeit.*, 1921, **113,** 145-75).—Paramœcia and other infusoria are rendered sensitive to light by addition of fluorescent substances.—H. K.

1189. Aggregation of Flagellates and their Reactions to Dissolved Oxygen. H. M. Fox (*J. Gen. Physiol.*, 1921, **3,** 483-511).—This phenomenon occurs under the cover-glass, because the optimal oxygen tension of these organisms is less than that of the atmosphere. It occurs, therefore, at a region towards the centre. A certain limiting oxygen tension is required for the effect to show itself at all. As the oxygen tension in the middle becomes lower, the organisms leave a clear central area. Concentrations of oxygen greater than the optimal have no injurious effect. Those below the optimal have a temporary inhibiting effect on the movements. The facts have to be taken into account in work on chemotropism.—W. M. B.

1190. Oxygen Supply of Animals Living in Water containing no Dissolved Oxygen. A. E. Cole (*J. Exp. Zool.*, 1921, **33,** No. 1).—Birge and Juday have shown that for part of the year the water at the bottom of Lake Mendota is devoid of dissolved oxygen, yet certain animals continue to live there. The oxygen supply of these (larvæ of *Chironomus tentans*) during this period was studied. *C. tentans* is not anaerobic at this time, as is shown by its reaction to potassium cyanide. A peculiar enzyme complex was found in the bodies of the larvæ and of certain other animals having the same habitat, which suggests the possibility of oxygen production within their own bodies, although this has not been definitely demonstrated. Plant fragments on the lake bottom were shown to be capable of producing a powerful oxidising agent. Experiments point to the conclusion that this oxidising agent is atomic oxygen. Such being the case, the oxygen could easily be utilised by animals living in the stagnated region.—W. D. H. (*W. I.*).

1191. Effects of X Rays on Drosophila. J. W. Mavor (Proc., *Amer. J. Physiol.*, 1921, **55,** 283).—There is a definite period in pupation of the fruit-fly lasting from 12 to 18 hours, during which the resistance of the pupa to X rays is increased tenfold.—W. D. H.

1192. Locomotion of the Holothurian Stichopus. G. H. Parker (*J. Exp. Zool.*, 1921, **33,** No. 1).—*S. panimensis* creeps on its trivium by means of locomotor waves of a direct monotaxic type. These waves progress over the animal at a rate of about 0·39 cm. per second, and enable the animal to creep a metre in about 15 minutes.—W. D. H. (*W. I.*).

1193. Salt Antagonism in Artemia. E. G. Martin and B. C. Wilbur (Proc., *Amer. J. Physiol.*, 1921,**55,** 290-1).—These shrimps live in brine pools of which the salinity greatly exceeds that of sea-water. Their surface resistance to inward diffusion of salts must be great, as their body fluids contain less salt than sea-water. Transfer to weaker brine causes immobility followed by death; this is specially seen in young shrimps, and the change even after short exposures to sea-water is irreversible. Some details are added in reference to individual salts, NaCl, KCl, $CaCl_2$, and $MgCl_2$, and mixtures of the same. —W. D. H.

1194. Spermatogenesis of Lepisma domestica. H. H. Charlton (*J. Morph.*, 1921, **35,** No. 2).—*L. domestica*, though a primitive insect, shows a complicated condition in spermatogenesis; 34 chromosomes are found in the spermatogonia, but instead of the expected 17 in the primary spermatocyte, 18 are present, since 2 of the chromosomes do not unite. In the ensuing division these 2 idiochromosomes pass undivided to one pole, so that the secondary spermatocytes possess 16 and 18 chromosomes respectively.

Similar numbers are found in the spermatids. The history of the centrosome has been followed throughout, and its persistence leads one to look upon it as a permanent though changeable structure. In the spermatogonia the centrosome has the form of a spherical granule, is V-shaped in the primary spermatocyte, and appears as a single rod in the division figure of the secondary spermatocyte. Each spermatid has one rod centrosome, and from it the axial filament grows out. By a rotation of the cell the centrosome comes to take a terminal position and later forms the acrosome, while the axial filament comes into secondary contact with the middle piece. The development of the middle piece is not quite clear, but it arises presumably from the nebenkern. That portion of the axial filament between the acrosome and the middle piece becomes the undulatory membrane of the spermatozoon.—W. D. H. (*W. I.*).

1195. Tarsal Chemoreceptors of Butterflies. D. E. Minnich (*J. Exp. Zool.*, 1921, **33,** No. 1).—The nymphalid butterflies, *Pyrameis atalanta* and *Vanessa antiopa*, respond to chemical stimulation by uncoiling the proboscis. By means of this response, it has been possible to study some hitherto unknown organs of chemical sense. These organs are situated in the tarsi (distal ends) of the 4 walking legs. They enable the animals to distinguish between apple-juice and distilled water, though they are sensitive to both substances. Pyrameis is also able to distinguish a 1 M. saccharose solution from distilled water, and such solutions as 1 M. HCl, M/600 quinine sulphate, and 1 M. NaCl from either distilled water or 1 M. saccharose.—W. D. H. (*W. I.*).

CELLS AND TISSUES

1196. The Phagocytosis of Solid Particles. I. Quartz. II. Carbon. W. O. Fenn (*J. Gen. Physiol.*, 1921, **3,** 439-82).—The chances of collision between leucocytes and quartz particles of different sizes can be calculated, and the experimental rate of ingestion is found to be in accordance. A verification is provided by varying the speed of rotation of the tubes. Similar results were obtained with carbon particles. Phagocytosis of carbon is nearly absent unless serum is present. The clumping of unwashed leucocytes is accelerated by serum and by ingestion of carbon. The phagocytosis of bacteria does not follow the law for unimolecular reactions.—W. M. B.

1197. Amœboid Movements. L. Loeb (Proc., *Amer. J. Physiol.*, 1921, **55,** 280).—Amœboid movement is primarily due to alternating, reversible changes of protoplasmic consistency. The shell of the outflowing mass hardens. Changes of surface tension may be an additional factor. The formation of drops on the cell surface during cytolysis and of fertilisation membranes are phenomena of the same order.—W. D. H.

1198. Sensitiveness of Leucocytes to Acid, as indicated by their Phagocytic Activity in Vitro. Alice C. Evans (Proc. Soc. Amer. Bacteriologists, December, 1920, *Abstr. Bacteriol.*, 1921, **5,** 17).—Leucocytes exert on slightly acid solutions the same kind of a buffer action as blood-serum. Leucocytes which have undergone a chemical change as a result of the absorption of free H-ions show an impaired capacity for phagocytosis proportional to the extent of the chemical change. In order to obtain reliable results with the test for phagocytosis promoting antibodies in immune serum, it is necessary to avoid exposing the leucocytes to acid solutions. The sodium citrate produced by some chemical firms contains enough acid to injure the leucocytes when used in preparing the suspension for the phagocytic test.—*Author's abstract.*

1199. (1) Sur l'évolution du chondriome de la cellule pancréatique depuis la naissance jusqu'à l'âge adult, chez le lapin. (2) Quelques observations sur l'évolution cytogénétique du pancréas du Hérisson. (3) Quelques observations sur la cellule hépatique du Hérisson. (4) Observations sur l'évolution de la cellule hépatique du Hérisson. P. R. Chaves

(*Bull. de la soc. portugaise des sci. nat.*, 1918, **8**, fasc. 1; 1919, **8**, fasc. 3; *ibid.*, fasc. 3, reprints, 7, 14, 16 pp. respectively; *Compt. rend. soc. biol.*, 1920, **83**, 879-81).—(1) The mitochondria of the pancreatic cells of adult rabbits appear as long and bent filaments arranged more or less parallel to the long axis of the cells, and they may intercross; at other times they are seen as simple independent threads (ramified chondriocontes); in yet other instances they appear as anastomosing filaments fusing into a network. These mitochondria of new-born rabbits appear either as spherical and ovoidal granules, or variously bent rods or short threads, or dumb-bell shaped granules. They are more or less evenly scattered throughout the cytoplasm; though generally maintaining a certain axial position, those which are nearer to the nucleus are often arranged so as to surround it. In the course of development they become gradually transformed into the long filaments characteristic of the adult, a stage which is reached at about the 20th day after birth. Experiments made by the author showed that changes in the quality of food have no influence upon this gradual transformation. (2) The mitochondria of the pancreatic cells of the hedgehog undergo a similar evolution. As in the rabbit, this transformation is most clearly seen during the first days of extra-uterine life. During intra-uterine life numerous secretion granules appear in the cytoplasm, and are also found in the pancreas of new-born hedgehogs; but they considerably diminish in number as soon as lactation begins. This fact indicates that during the last stage of embryonic life the pancreatic cells are preparing for the first digestive acts of the suckling. (3, 4) The hepatic cells of the hedgehog go through similar changes. During embryonic life they increase in volume and become vacuolised, in consequence of the accumulation of fatty materials, which disappear and are apparently utilised by the new-born animals at the beginning of extra-uterine life, but they reappear in the course of lactation. At the same time the mitochondria, which are represented in the embryonic cells by very small granules, shape themselves at first as rods and large granules, later also as short and variously bent threads.—C. d. F.

1200. Note sur le pancréas intrahépatique et sur les cellules hépatiques de l'Orthagoriscus mola. A. S. M. M. Ramalho (*Bull. de la soc. portugaise des sci. nat.*, 1918, **8**, fasc. 1, reprint, pp. 3).—As in *Crenilabrus melops* and other bony fishes, the pancreas of *O. mola* has intrahepatic ramifications. These consist of tubular alveoli, which lie either on the endothelium of intrahepatic veins or on a thin basement membrane which separates them from the vascular wall. A similar membrane can be seen between the pancreatic tubules and the hepatic tissue. The cells which line the alveoli are polyhedral and their inner portion is filled with secretion granules. The nuclei are situated in the outer third of the cytoplasm, and their chromatin is arranged in small masses near the nuclear membrane. The hepatic cells of *O. mola* look like the cells of adipose tissue, and consist of a delicate protoplasmic envelope enclosing a large vacuole, and which is thickened at one side to enclose the nucleus. The author, however, cannot state whether fatty or lipoid materials are contained in the vacuoles. In the envelope granules can be detected, which are probably mitochondria.—C. d. F.

1201. Le paranucléus de la cellule pancréatique. P. R. Chaves (*Compt. rend. soc. biol.*, 1920, **83**, reprint, pp. 3).—The author cannot accept the view recently expressed by Saguchi (Abstract No. 2967, 1920, Vol. IV., p. 479) that certain intracellular structures described as paranuclei are artifacts due to the coagulation of protofibrillæ pre-existent in the cytoplasm. Chaves agrees with Saguchi that certain fixatives alter the cytoplasm in such a way as to impart to it an apparent lamellar structure, but, in spite of this, real paranuclei can be seen in pancreatic cells. Such paranuclei are generally formed by concentric lamellæ, and originate from nucleoli migrated into the cytoplasm. Before passing into the lamellar stage they are more or less homogeneous, as Saguchi himself seems to have admitted.—C. d. F.

1202. Zur Kenntnis der sogenannten Saftbahnen des Knorpels. O. Schultze (*Arch. f. mikroskop. Anat.*, 1920, **94,** 254-67).—Histological description of the so-called sap canals of cartilage.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1203. Über Kalkbildung durch tierische Gewebe—II. E. Freudenberg and P. György (*Biochem. Zeit.*, 1921, **115,** 96-108).—A detailed account of experiments which show that the cartilage of adults and of the calf can take up Ca from solutions independently of the anion. For sucklings the amount of Ca taken up depends on the anion, being least for acetates and nitrates. The fixation of various cations follows in the order Mg < Ca < Sr < Ba < Al. When present in mixtures, Ca is taken up by cartilage more than magnesium, but the reverse holds for the brain.—H. K.

1204. Mitochondria and Golgi Apparatus of the Giant-Cells of Red Bone-Marrow. H. E. Jordan (*Amer. J. Anat.*, 1921, **29,** No. 1).—The giant-cells of the red marrow (megakaryocytes) contain abundant granular and a few bacillary mitochondria. In the earlier stages the bacillary forms predominate, in the later stages the granular are in excess. The same cells contain also a relatively small Golgi apparatus, which fragments and disappears in the later multinucleated stages. These structures can be demonstrated after prolonged treatment with a 2% solution of osmic acid. The Golgi apparatus is an entirely different structure from the canalicular network or "trophospongium" of Retzius. The trophospongium of these cells, as demonstrable in Carnoy-fixed tissue, is an artifact; the Golgi network consists of anastomosing varicose fibrils and rods, and it and the mitochondria are essentially only morphologically different portions of the same substance, the former resulting from a fusion of the latter while aggregated in the neighbourhood of the centrosphere.—W. D. H. (*W. I.*).

1205. Enzymes of Abdominal Fat in Turkeys. J. S. Hepburn (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xlviii).—In dry packed specimens, catalase, lipase, and esterase were found. Simple reductase and oxidase were usually found; but oxidases acting on *a*-naphthol and tricresol, and protease were absent. Aldehyde-reductase and peroxidases were sometimes found.—W. D. H.

1206. Dynamics of Histogenesis. IV. Tension of Differential Growth as a Stimulus to Myogenesis in the Limb. V. Compression between the Accelerated Growth Centres of the Segmental Skeleton as a Stimulus to Joint Formation. VI. Resistances to Skeletal Growth as Stimuli to Chrondrogenesis and Osteogenesis. E. J. Carey (*Amer. J. Anat.*, 1921, **29,** No. 1).—The various stages of the developing skeleton are the resultants of the mechanical resistances to growth.—W. D. H. (*W. I.*).

1207. Une nouvelle hypothèse de travail sur la signification physiologique des protamines et des histones par rapport au métabolisme nucléaire. A. Clementi (*Arch. intern. physiol.*, 1921, **16,** 100-18).—Previously published elsewhere (Abstract No. 139, Vol. VI., p. 20).—W. D. H.

MUSCLE

1208. Muscular Contraction. II. The Relation between the Maximal Work and the Tension developed in a Muscle Twitch, and the Effects of Temperature and Extension. Y. Doi (*J. Physiol.*, 1921, **54,** 335).—The ratio W/Tl expresses the relation between the maximal work (W) done by a single twitch and the tension (T) developed; l is equivalent to the length of the unextended muscle, and is introduced for comparative purposes. The ratio is a constant independent of the extension of the muscle (this substantiates A. V. Hill's principle of determining the mechanical work of muscle from its tension), and is slightly smaller at a high than at a low temperature.—R. K. S. L.

1209. Myographische Studien bei übererregbaren jungen Kindern. O. Bossert and R. Gralka (*Jahrb. f. Kinderheilk.*, 1921, **94/44,** 145-72).—The reaction of the muscles

towards electric stimulation was studied. The form of the muscle curve is in children with mechanical and electrical over-excitability nearly the same as the normal. If spasms (carpopedal spasms) occur also, a muscle curve with steep ascent and broad summit is obtained. Children with over-excitability with laryngospasm and cramp have high and acute angled curves. This is related to a special excitability of the central nervous system. Children with œdema often have a lower curve. The author regards this as a valuable method for distinguishing different types of excitability.—H. W.

1210. Kohlensäuredruck oder Eiweissquellung als Ursache der Muskelkontraktion? O. v. Fürth (*Biochem. Zeit.*, 1921, **113,** 42-51).—Polemical.—H. K.

1211. Radio-activity and Smooth Muscle. E. Soref (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxxiii).—The action of radio-active bodies such as uranium, thorium, and rubidium salts was found to be similar to that of K upon a guinea-pig's uterus immersed in Locke-Ringer solution, except that smaller doses were required. For cæsium a larger dose than that of KCl was required. Free radiations, too, were effective, for the proximity of a capsule of meso-thorium produced an increased tonus of the uterus. Intravenous injections into a pithed cat of rubidium and uranium salts resulted in a rise of arterial pressure, while its uterus and the intestines responded as they do to adrenaline. Thorium and potassium were fatal.—I. F.

1212. Fatigue in Frog Muscle immersed in Various Concentrations of Lipoid Solvents, especially the Higher Alcohols. F. M. Baldwin (Proc., *Amer. J. Physiol.*, 1921, **55,** 284-5).—The muscles were found qualitatively susceptible to different concentrations; this implies an intimate relation between the physical state of the muscular envelope or plasmic membrane and the changing physiological conditions within it.—W. D. H.

1213. Über die Rolle der Milchsäure bei der Bildung und Lösung der Muskelstarre. H. H. Weber (*Pflüger's Arch.*, 1921, **187,** 165-92).—The volume changes of minced frog muscle were studied by the use of a specially constructed "osmometer" closed by a membrane made from ox intestine (permeable to water and salts), and provided with a horizontal graduated capillary for reading volume alterations. Great swelling was produced by lactic acid in 0·02 to 0·05 *n* solution in Ringer, thus supporting v. Fürth's theory of the causation of rigor. Heat-coagulated muscle takes up less water from dilute HCl than fresh muscle. The contraction which occurs when acid-swollen muscle is treated with 1% KCNS is due to removal of ions, and not to coagulation, which only sets in when the tissue has contracted considerably. That coagulation due to lactic acid is a cause of the resolution of rigor is disproved by the fact that heat coagulation is inhibited by acids, and also that acids inhibit the shrinkage produced by KCNS; further, muscle proteins which clot in water remain fluid in presence of 0·02 to 0·05 *n* lactic acid. During the resolution of rigor there is considerable loss of substance from intact muscles. It is concluded that resolution is due to liquefaction resulting from excessive swelling.—C. L. E.

1214. Denervated Muscle. F. A. Hartman and W. E. Blatz (Proc., *Amer. Physiol., J.* 1921, **55,** 284).—Nerves were cut or crushed in rabbits, and regeneration was (in the cut cases) checked until suture was performed months later. Return of function occurred earlier in crushing experiments. No benefit accrued from massage or galvanic stimulation of the muscles.—W. D. H.

1215. Regeneration of Denervated Mammalian Muscle. IV. Effects of Massage and Electrical Treatment in Secondary Sutures. F. A. Hartman and W. E. Blatz (*J. Physiol.*, 1921, **54,** 392).—Neither massage nor electrical treatment appears to benefit denervated muscle either before or after secondary suture performed at intervals of 1 to 7 months (see Abstract No. 522, Vol. V., p. 82).—R. K. S. L.

1216. Some Observations on Loss of Nitrogen in Muscular Atrophy in Men and Animals. A. W. Peters and A. E. Guenther (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxii).—Experiments on the nature of the loss of weight incurred by muscular atrophy consequent on nerve section. The atrophy was not dependent on loss of water, but of substances containing nitrogen. The atrophic muscles showed a marked maintenance of physiological capacity.—J. C. D.

NERVE. REFLEX ACTION

1217. The Temperature Coefficient of the Velocity of a Nervous Impulse. A. V. Hill (*J. Physiol.*, 1921, **54,** 332).—The velocity of a nerve impulse depends on 2 factors: the velocity of the local change, and the velocity of propagation of this change between the contiguous particles. This being the case, a high temperature coefficient (as was found by Keith Lucas) only demonstrates that a chemical change "interposes somewhere in the process," but where exactly can only be judged when the relative importance of these 2 factors are known.—R. K. S. L.

1218. The Conductivity of the Nerve Ending in Acid Solutions. Y. Zotterman (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxvi-ix).—To test the effect on the nerve endings of perfusing (through a muscle) Ringer's solution of varying P_H the recovery curve of the nerve was determined by using the summated contraction of the muscle as an indicator of the success of the second stimulus. In acid solutions ranging from P_H 6·5 to 4·5 (below which the acidity damaged the muscle) an increase in the least interval for muscular summation was found; however, this result was never obtained in less than 2 hours. As no increase in the refractory period of the nerve itself nor in the absolute refractory period of a curarised muscle was found, the increase in the interval for muscular summation must be due to some alteration in the nerve endings. —I. F.

1219. Heat Block in Nerves. P. M. Dawson and E. O. Ostlund (Proc., *Amer. J. Physiol.*, 1921, **55,** 313-4).—In frogs, 45° C. blocks sensory, but not motor impulses; 46° to 50° has the same effect on rabbit's nerve. Heating was produced by a stream of hot saline. Either the sensory fibres are more sensitive to heat, or the sensory fibres form a sheath around, and so protect the motor fibres. No crucial experiment to settle this was performed.—W. D. H.

1220. Tonus Rhythm in Diaphragm of Cats. L. B. Nice and A. J. Neill (Proc., *Amer. J. Physiol.*, 1921, **55,** 311).—The method of registering these oscillations is described; so also are experiments to determine whether these are wholly of central origin, or in part due to changes in the irritability of the muscle. The authors omit to state their conclusion, and it is always unsafe for another to do so.—W. D. H.

1221. Muscular Responses to Submaximal Stimulation of Motor Nerves as affected by Reflex Excitation and Inhibition. L. R. Whitaker and A. Forbes (Proc., *Amer. J. Physiol.*, 1921, **55,** 291-2).—Verworn stated that reflex inhibition is central, since stimulation of the motor nerve during inhibition is equally effective as in the normal state. Forbes and Rappleye argued that the response should be greater during reflex inhibition (since no muscle fibres are active, and therefore all are excitable) than in reflex excitation, as in decerebrate rigidity and similar conditions. The present experiments on decerebrate cats gave some exceptional results, but the general conclusion drawn is that the normal discharge in decerebrate rigidity is fundamentally the same as in other forms of reflex excitation.—W. D. H.

1222. Ammonia Production in Nerve. S. Tashiro (Proc., *Amer. J. Physiol.*, 1921, **55,** 281-2).—A basic volatile substance giving the tests for ammonia is formed in addition

to CO_2 in nerve during activity. It tends to neutralise the CO_2, though it is not formed in amount sufficient to do so thoroughly, but this may be a factor in the unfatiguability of nerve.—W. D. H.

1223. The Ester-Splitting Properties of the Peripheral Nerves. S. Ukai (*Tohoku J. Exp. Med.*, 1920, **1**, 519).—A butyrinase is present in the sciatic nerves of the rabbit and of man; it is more marked in the former.—R. K. S. L.

1224. Can an Indicator Method be used for Measurement of CO_2 Production from Isolated Nerve? S. Tashiro and E. M. Hendricks (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xv).—The indicator method is not as accurate as the biometer method, but when it is used certain precautions which are outlined should be adopted —J. C. D.

1225. Effects of Magnesium Chloride on Nerve. Esther Greisheimer and C. E. Shepard (Proc., *Amer. J. Physiol.*, 1921, **55**, 319-21).—$MgCl_2$ caused a fall of conductivity in frog's nerve, but the depressant effect was not so marked as anticipated. The action of the salt is not strikingly different from that of KCl, RbCl, and $CaCl_2$.—W. D. H.

1226. Tonus and the Reflexes. J. K. A. Wertheim Salomonson (*Brain*, 1920, **43**, 369-89).—Lecture delivered at the Roy. Soc. of Medicine; the lecture form accounts for the paucity of the references to literature. The main theme is the results of examination by the string galvanometer of the muscular action currents observable in man in various forms of contraction of diagnostic importance. The author finds these contractions fall into 3 groups: (1) The twitch with a single diphasic current; (2) tetanic contraction typified by voluntary contraction showing an irregular series of alternating currents at about 50 per second; (3) contractions unaccompanied by any detectable current. To group 1 belong all "deep" reflexes, "tendon" as well as periosteal. To group 2 belongs the normal plantar reflex. To group 3 belongs all "muscle tonus." In myelitis with complete paralysis we may find enormous muscle spasms which do not show any "action current." "The absence of a typical action current seems the one and only means of differentiating between a tetanic and a tonic spasm or contraction." "I find with Dusser de Barenne decerebrate rigidity to be a tetanic state." In the Babinski plantar reflex the contraction follows at end of the period of tetanic action currents, and during the contraction there is no observable current.—C. S. S.

1227. Movimientos y Reflejos del Feto humano duranto la primera Mitad del Embarazo. M. Minkowski (*Trabajos d. lab. d. investigaciones biol.*, Univ. d. Madrid, 1921, **18**, 269-75).—In human fœtuses (3) of 2 to 2·5 months examined in normal saline at 37° C. reflex movements are obtained by skin stimuli and by proprioceptive stimuli (passive movements). The movements tend to be widely spread; thus, excitation of foot excites movements not only of retraction of the foot, but of both arms, and of the trunk and head. In 3 to 5 months' fœtuses (5) there are tonic reflexes as well, these latter obtainable by passive movements of the head and neck. In 1 case pressure on the tongue evoked closure of the lips and jaws. In 3 cases the plantar reflex in the plantar flexion form was observed. Inhibitory reflexes were also remarked. The interesting paper, which is furnished with a good bibliography of the subject, concludes that the human fœtus during the 2 to 5 months' stages is from the neurological standpoint essentially a bulbo-spinal organism.—C. S. S.

CENTRAL NERVOUS SYSTEM

1228. The Physiology of the Elementary Nervous System : Its Bearing upon Neurological Problems. F. M. R. Walshe (*Med. Science*, 1921, **4**, 141-5).—An enquiry as to how far the observations of Parker (*The Elementary Nervous System*), confirm the views

of Head (*Studies in Neurology*) and of Rivers (*Instinct and the Unconscious*) that in protopathic sensibility and in the "mass reflex" of spinal man we see approximation to the sensori-motor reactions of primitive animals. The author suggests that the chaos of reflex responses seen in the protopathic animal is but a pathological demonstration of spinal anarchy wherein a stimulus, neither localised nor defined, evokes sweating, micturition, flexion of the hind limbs, or squatting. With the appearance of such an animal the process of evolution must inevitably have ceased. Parker has shown in the sea anemone that the responses are not of the "all-or-none" nature, but are finely graded according to the strength and site of the stimulation. In polyps also he observes a delicately localised and graded response to localised stimuli, and concludes: *This accurate form of response of a distantly located organ to a circumscribed stimulus has all the characteristics of a reflex.* It is thus evident that the nervous system from its earliest origin is capable of assuring a perfect though simple co-ordination. The "crude" forms of activity which Rivers supposes the elementary nervous system to possess are not to be seen in the animal kingdom. The word "crude" means anything, defines nothing, and has no more place in biology than that quaint figment "the protopathic animal" whose nervous system it describes. The nervous system may be simple, but never crude. The reasons for the assumptions of Rivers that the graded reactions of insects must have been derived from *originally crude modes of response* under some *graduating mechanism* seem to be the requirements of a hypothesis not in accordance with facts. It is concluded that the wide diversity between the hypothesis of Head and his co-workers in this respect and in what we actually know of the elementary nervous system shows that the Jacksonian principle is a fallible instrument employed as a universal law, and should, as a working hypothesis, be used with discrimination. There is a probability that function is sometimes quantitatively altered or perverted in a fashion not to be explained along these simple lines.—J. A. H.

1229. Caracteristicas de excitabilidad de los centros motores corticales. V. Tedeschi (*La Prensa Med. Argentina*, 1920, **7,** No. 27).—La cronaxie de la substance grise cérébrale de la zone motrice du cerveau varie de 0·0022 à 0·0051; la cronaxie de la substance blanche est 0·00018.—B. A. H.

1230. The Relation of the Cerebrum to Arterial Pressure. F. T. Rogers (*Arch. Neur. and Psychiatry*, 1920, **4,** 148-50).—See Abstract No. 172, Vol. VI., p. 25.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1231. Cerebrum and Sympathetic. F. T. Rogers (Proc., *Amer. J. Physiol.*, 1921, **55,** 310).—Removal of hemispheres in pigeons leads to permanent slight fall of arterial pressure. Electrical stimulation of cerebral cortex has little or no effect on the smooth muscles of the feathers, unless the area excited is at the base of the hemisphere, when the feathers flatten.—W. D. H.

1232. Die Morphologie des Vogelgehirns in ihren Beziehungen zur Biologie. F. Groebbels (*Pflüger's Arch.*, 1921, **187,** 299-325).—C. L. E.

1233. Über das Nervensystem unter normalen und pathologischen Bedingungen. VIII. Beitrag zur chemischen Zusammensetzung des Gehirns bei Dementia præcox. G. Pighini (*Biochem. Zeit.*, 1921, **113,** 231-45).—The results of chemical analysis (extraction with various solvents) show increased water content, diminution of unsaturated phosphatides, a marked diminution of saturated phosphatides, and an apparent increase in cholesterol and residual protein.—H. K.

SPECIAL SENSE ORGANS

1234. Inhibition of Sphincter Iridis. D. R. Joseph (Proc., *Amer. J. Physiol.*, 1921, **55,** 279-80).—Stimulation of the cervical sympathetic in cats and dogs caused enlargement of the pupil. The technique, which includes care that no radiating fibres could have been concerned, is briefly described.—W. D. H.

1235. A Retinal Reflex in the Frog following Benzene Administration. A. T. Cameron and F. A. Sedziak (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xcv-vii).—A dose of benzene (1·2% body-weight, optimal) injected into *R. pipiens* gives rise to a retinal reflex evoked by any change in intensity of light. The response varies from slight head movements to powerful movements of hind limbs, and is greater, more persistent, and more resistant to ether anæsthesia for a sudden decrease of light than for an increase. Results obtained with other hydrocarbons are noted.—M. L. W.

1236. Stereoscopic Effects produced by Pictures of Different Sizes. E. H. Hankin and H. Hartridge (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxvii-ix).—Stereoscopic relief was observed in a portion of a picture if 2 photographs were taken, one a few inches nearer the object than the other, and then placed side by side in a stereoscope. The stereoscopic relief appeared on the right side of the picture if the right-hand picture was the smaller of the two, while the opposite side presented a pseudo-stereoscopic appearance. No relief effect was observed along the central vertical line of the picture. If the point towards which the camera was moved was situated on this line, so that when the pictures were each divided equally by a vertical cut and the halves of the larger picture were centrally placed, stereoscopic relief was observed diminishing progressively from the periphery towards the central line where it was absent. When the halves of the larger photograph were placed in the alternative position, then a pseudo-stereoscopic effect was produced again, excepting along the central line. An approach of 12 inches between the taking of the photographs gave an exaggerated stereoscopic effect; as seen in commercial stereoscopic views, the normal effect was best observed with a difference of 3 inches. An explanation with diagrams follows.—I. F.

1237. Light-Spot Adaptation. K. Dunlap (*Amer. J. Physiol.*, 1921, **55,** 201-11).—Vision on a peripheral part of the retina can be inhibited by stimulation of the fovea by steady fixation of a faint spot of light. When disappearance has occurred, the removal of the illumination is obvious either by momentary reappearance, by a darker area, or by a coronal effect. The inhibition is central, as shown by the fact that stimulation of one retina inhibits the other. The disappearance is not due to movement of the eye.—W. M. B.

1238. Vindication of the Resonance Theory of Hearing. H. Hartridge (*Brit. J. Psychol.*, 1921, **11,** 277-88).—Arguments against Perrett's views (review in Vol. IV., p. 515). Perrett says the ear is unable to appreciate a short silent interval and to differentiate "utter" from "udder," but with syren and resonator the ear perceives a short silence as a short noise, and this is readily explained on the Helmholtz basis. Then the difference in width of parts of the basilar membrane are said to be insufficient to explain the hearing of notes of different pitch; but they are sufficient if tension and mass are taken into account also. There is no evidence that the number of elements in the membrane is too few. The Helmholtz theory accounts for the ability of the ear to perceive a note ending staccato provided successive contrast is considered; it also explains the perception of a note beginning at full strength, and how simultaneous bass and treble notes begin and end together.—W. D. H.

1239. Über der Einfluss des Stirnhirns auf die vestibularen Reaktionsbewegungen. J. Rothfeld (*Festsch. d. 25 jahr. Jubil. d. med. Fak. d. Univ. in Lemberg*, 1920).—In a

normal rabbit stimulation of the labyrinth by horizontal rotation in either direction leads to a horizontal nystagmus of eyes and head, consisting of alternate slow turning of the head in the direction of rotation and sudden return in the opposite direction. Ablation of one frontal lobe leads to a loss of any rapid movements which would tend to occur towards the undamaged side. The slow component of the nystagmus appears to be localised in the mid-brain.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

PSYCHOLOGY

1240. Psychological Tests for Aviators. G. M. Stratton, H. C. McComas, J. E. Coover, and E. Bagby (*J. Exp. Psychol.*, 1920, **3,** 405-23).—The 3 following tests (judgment of relative speeds of moving objects, judgment of parabolic curves, complex reaction time) in the order named show promise of usefulness for the purpose. Further trial is needed.—W. D. H.

1241. Static Control in Standing. W. R. Miles (Proc., *Amer. J. Physiol.*, 1921, **55,** 309-10).—The man wears a helmet with a frame and writing-point which records his swaying movements. The test is quantitative, and the nervous condition of the subject can be gauged in this way.—W. D. H.

1242. Brain Autolysis and Memory. H. C. Bradley (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxvii-viii).—The protective mechanisms which prevent a rise of H-ion concentration in the blood preserve the brain from autolytic changes.—J. C. D.

1243. Left-handedness and Mirror Writing, especially among Defective Children. H. Gordon (*Brain*, 1920, **43,** 313-68).—The percentage of children with marked left-handed activities is much higher in mental defective schools than in ordinary schools, and the left-handedness is more frequently associated with defects of speech than is right-handedness. The percentage of mirror writers is much higher in mental defective schools than in ordinary schools, and is in the former much higher among the left-handed than the right-handed. The inference is that the proper activity of the dominant cerebral hemisphere, the left, has been interfered with.—C. S. S.

1244. The Galvanometric Measurement of Human Emotion. A. D. Waller (*Nature*, 1921, **107,** 183-6).—A discourse.—C. L. E.

CEREBRO-SPINAL FLUID

1245. Cerebro-Spinal Fluid after Adrenaline, etc. F. C. Becht (Proc., *Amer. J. Physiol.*, 1921, **55,** 277).—Adrenaline, pituitrin, and pilocarpine cause movements of the fluid in a manometer connected to the subdural cavity which are attributed to alterations in blood-volume.—W. D. H.

1246. Sur la permeabilité des plexus choroïdes. A. Barbé (*Rev. neurol.*, 1920, **27,** 314-9).—Already abstracted (Abstract No. 215, Vol. VI., p. 32), but the volume of the revue is not **1**, but **27,** as above.—W. D. H.

1247. Hypertonic Salt Solution and Intracranial Pressure. E. Sachs and J. Y. Malone (Proc., *Amer. J. Physiol.*, 1921, **55,** 277-8).—Following Weed and McKibben's work, 30% salt solution was injected into the femoral vein of dogs, and records taken through trephine holes of brain volume and intracranial pressure. Blood-pressure and respiration were also recorded. The main result (shrinkage of brain lasting for hours) was so striking that the method was used clinically on patients with high intracranial pressure, and with good results even in desperate cases. Whether the shrinkage is due to dehydration of brain or change in rate of secretion of cerebro-spinal fluid is uncertain. Glucose solutions of high concentration (30%) do not produce the effect.—W. D. H.

BLOOD

1248. The Suspension Stability of the Blood. R. Fåhræus (Doctorate Thesis; Stockholm, 1921, Norstedt and Söner; reprint, *Acta Medica Scand.*, **55**, pp. 228).—A remarkably able and well-written thesis, in which the subject of blood-sedimentation is thoroughly discussed. Several papers recently abstracted are the direct outcome of observations made by this author. The bibliography, including older and ancient references, is large and quite up to date. The increased sedimenting velocity of blood in pregnancy and in certain diseases is due chiefly to increased agglutination and to diminished numbers of corpuscles. Agglutination is dependent on the properties of the plasma, which are fully discussed; the chief one appears to be an increase in the globulin content. Under some conditions there may be a tendency to sedimentation *in vivo*. It is, unfortunately, impossible to do justice to the volume in a review, but the clinical importance of the subject is considerable.—C. L. E.

1249. Vergleichende Untersuchungen über die Senkungsgeschwindigkeit der Blutkörperchen im Zitratblut und den stalagmometrischen Quotienten. W. Schemensky (*Münch. med. Woch.*, 1920, **67**, 1228-9).—When blood is left to stand *in vitro*, the rate of sedimentation of red cells is observed. This rate is increased in blood from cases of pregnancy and various pathological conditions. The author finds, in 70% of hospital cases examined, an increased rate of sedimentation of red cells goes hand in hand with a lowered surface tension in the urine. (See also Abstract No. 412, Vol. VI., p. 63.)—J. H. B.

1250. Die Senkungsgeschwindigkeit von roten Blutkörperchen. P. György (*Biochem. Zeit.*, 1921, **115**, 71-84).—The sedimentation of ox corpuscles is uninfluenced by electrolytes or non-electrolytes. For the corpuscles of man the rate of sedimentation is as a rule also uninfluenced, but in presence of lecithin, ethyl alcohol, or propyl alcohol it falls off slightly.—H. K.

1251. Der osmotische Druck in Blutkörperchen und Plasma. Studien über das osmotische Verhältnis der Blutkörperchen—II. R. Ege (*Biochem. Zeit.*, 1921, **115**, 174-87).—A critical survey of the question as to whether the osmotic pressure of the corpuscles is the same as the plasma. The possibility is discussed that they are different, the envelopes of the corpuscles showing a resistance to swelling or shrinking. Measurements of the freezing-point depression of the plasma and the corpuscular contents are attended with great difficulties.—H. K.

1252. Über das Volumen der Blutkörperchen in gegenseitig osmotischen Losungen. Studien über das osmotische Verhältnis der Blutkörperchen—I. R. Ege (*Biochem. Zeit.*, 1921, **115**, 109-15).—Hæmatocrit experiments show that if corpuscles are suspended in solutions containing salts with a monovalent anion, a constant volume is not attained immediately, but swelling takes place more rapidly in chlorides than nitrates, although the chloride and nitrate may be isosmotic. This is attributed to the different velocity with which the anions penetrate the membrane. With non-electrolytes such as hexoses or dihexoses or salt solutions containing divalent anions SO''_4 and CO''_3 there is no swelling.—H. K.

1253. Über die Verteilung des zum Blute hinzugefügten Wassers zwischen Blutkörperchen und Serum. T. Takei (*Biochem. Zeit.*, 1921, **115**, 220-34).—Refractometric and hæmatocrit experiments show that when water is added to the blood of man, ox, or rabbit *in vitro*, in quantities which might be expected physiologically *in vivo*, the serum takes up more water in proportion to its volume than the corpuscles.—H. K.

1254. Autolysis of Red Corpuscles. W. Morse (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xlvi-vii).—No evidence was obtained that this occurs.—W. D. H.

1255. Die Veränderungen der biologischen und anderer Eigenschaften der lange überlebenden roten Blutkörperchen. J. Sogen (*Tohoku J. Exp. Med.*, 1920, **1**, 367).—Red corpuscles from healthy rabbits may be kept alive for more than 40 days *in vitro;* they take up O_2 during the whole of this time, their oxygen capacity remaining constant. Their volume, osmotic resistance, and viscosity increase up to the 20th to 30th day, and then diminish. (Unfortunately there is no note of the CO_2 given off.) Blood from anæmic animals take up O_2 much more rapidly.—R. K. S. L.

1256. Rate of Methæmoglobin Formation from COHb. T. K. Kruse (Proc., *Amer. J. Physiol.*, 1921, **55**, 289).—This is 100 to 200 times slower than from OHb when potassium ferricyanide is added. This may be used to detect CO in blood.—W. D. H.

1257. Über die Lichtabsorption des reduzierten Hämoglobins. P. Hári (*Biochem. Zeit.*, 1921, **115**, 52-62).—The absorption of light over a large portion of the visible spectrum of reduced hæmoglobin has been investigated. The reduction was effected by sodium hydrosulphite or putrefaction. A comparison is made with Hufner's values.—H. K.

1258. The Action of Tissue Extracts in the Coagulation of Blood. C. A. Mills (*J. Biol. Chem.*, 1921, **46**, 167-92).—Tissue extracts accelerate the clotting of blood in a very definite manner. The active substance will not react with fibrinogen to form fibrin except in the presence of soluble calcium salts. It produces intravascular clotting when injected intravenously. There is a certain class specificity which, however, is not absolute. (See also Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, viii-ix, xxix-xxx.)—J. C. D.

1259. Tissue Coagulins. C. A. Mills (*J. Biol. Chem.*, 1921, **46**, 135-65).—The active principle in tissue extracts is in part protein, and possesses an isoelectric point between $N \times 10^{-5}$ and $N \times 10^{-6}$ acidity. Its properties resemble those of a globulin-phospholipoid complex. Its activity on blood-coagulation depends on the union of the phospholipoid and the protein fractions.—J. C. D.

1260. L'action précipitante du chloroforme sur la solution de fibrinogène pur. P. Nolf (*Réunion de la soc. belge de biol.*, Jan. 29, 1921, 273-5).—Mélangé par une agitation forte à une solution de fibrinogène pur, le chloroforme précipite en partie cette substance sans l'altérer. Le fibrinogène précipité peut être redissous dans un liquide salin et subir encore l'action coagulante de la thrombine.—E. Z.

1261. Methodik der Untersuchung der Blutgerinnung. A. Fonio (*Schweiz. med. Woch.*, 1921, 146-51).—Description of a method by a new simple apparatus, by which in 20 c.c. blood the coagulation time, the coagulation valency (*i.e.*, the capability to overcome a measured inhibition of coagulation by $MgSO_4$), the elasticity, density, and contractibility of the clot are ascertained. This combined method of investigation is regarded as of great practical and prognostic importance.—H. W.

1262. Studien über Faserstoffgerinnung. II. Über das "gebundene" Chlor im Blute. W. Falte and M. Richter-Quittner (*Biochem. Zeit.*, 1921, **114**, 310-7).—For chloride estimations in biological fluids Korányi's method, which avoids precipitation of proteins, is the best. The authors withdraw their previous conclusion (Abstract No. 79, Vol. IV., p. 16) that a portion of the plasma chlorine is bound in non-ionisable form.—H. K.

1263. The Influence of Coagulation upon the Reaction of the Blood. J. P. Ross (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54**, lxxx-lxxxi).—Apparently the reaction of the blood is unaffected by coagulation. First a blank dialysis was carried out with calcium chloride upon defibrinated goat's blood, and it was shown that the reaction of the blood was unaltered. Then goat's blood was run into dialysers, one containing salt solution and the others different amounts of calcium chloride. The P_H in each case was the same within the limits of experimental error. Similar results were obtained with cat's blood.—I. F.

1264. Über Blutgerinnung bei Splenektomierten. E. Wöhlisch (*Münch. med. Woch.* 1921, **68,** 228-30).—The author has investigated the coagulation time and the concentration of fibrin ferment in the blood-serum of patients under various conditions. He has determined the effect of (1) splenectomy, (2) of X-ray illumination of the spleen region after splenectomy. Splenectomy has no harmful effect on blood-coagulation. X-ray illumination of the splenic region after splenectomy produced (in 2 cases) no increase in factors favouring rapid clotting, as it has been shown to do when the spleen is present. In a third case, however, of hæmolytic jaundice, a considerable diminution of the clotting time was observed, but the concentration of fibrin ferment in the serum fell.—J. H. B.

1265. Drüsenbestrahlung und Blutgerinnung. A. Szenes (*Münch. med. Woch.*, 1920, **67,** 786-8).—After exposure of the spleen to X rays a period of diminished coagulability of the blood in man was first observed, followed by a period of enhanced clotting power which could be still further enchanced by injection of 10% sodium chloride solution. The irradiation of pathological tissues, but not of the normal thryoid, produced a similar result. The effect is due to the liberation of thromboplastic substances during the tissue disintegration, and can be imitated by the injection of the press juice of damaged cells.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1266. A Crystalline Uric Acid Compound in Ox Blood. A. R. Davis and S. R. Benedict (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** v-vi).—The isolation of this compound is described. The analysis indicates that it is composed of uric acid and a pentose combined in molecular proportions.—J. C. D.

1267. Observations on the Occurrence of Creatinine and Creatine in Blood. H. J. Allen and S. R. Benedict (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxi).—Certain sources of error are pointed out.—J. C. D.

1268. Blood-Nitrogen after Liver Extirpation. F. C. Mann and T. B. Magath (Proc., *Amer. J. Physiol.*, 1921, **55,** 286).—In dogs the blood-urea falls to 50%; in geese it rises. The uric acid rises in dogs, falls in geese. The urinary ammonia rises; there is no change in P_H or CO_2 combining power of the blood. Creatinine in the blood is unchanged. Non-protein nitrogen and amino-N increase. This can be corrected by glycine injection.—W. D. H.

1269. Beiträge zur Kenntnis des Nichtproteinstickstoffs des menschlichen Blutes. II. Chemische Pathologie der Harnstofffraction. J. Feigl (*Zeit. f. d. ges. exper. Med.*, 1921, **12,** 55-133).—A summary of the present state of knowledge of the subject. Different methods are critically examined.—H. W.

1270. Über den Aminosäuregehalt des Blutes. K. de Snoo (*Diss. Utrecht*, 1920).—Results of determinations of the amino-acid nitrogen in blood and urine in normal subjects at various times after a meal, and in several patients.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1271. Physikalisch-chemische Untersuchungen an Körperflüssigkeiten. II. Der Zustand des Zuckers im Serum. S. Rusznyák. **III. Der Zustand des Reststickstoffs.** S. Rusznyák and G. Hetényi (*Biochem. Zeit.*, 1921, **113,** 52-5, 56-7).—II. A portion only of the reducing constituents of blood passes through on ultra-filtration. III. The non-precipitable N of serum is ultra-filterable, and therefore in the crystalloid state.—H. K.

1272. Lactic Acid. S. W. Clausen (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xviii).—A modified Ryffel method is described for 1 or 2 c.c. of blood, determining the α-hydroxy acid as lactic acid. Normal figures for children vary from 18 to 35 mg. per 100 c.c. The amount is increased in alimentary intoxication in infants.—J. C. D.

1273. The Phosphoric Acid Compounds in the Blood of Normal Infants. G. M. McKellips and I. M. De Young (Proc. Amer. Soc Biol. Chem., *J. Biol. Chem.*, 1921, **46,**

xiv).—The amounts and distribution of the various compounds in the corpuscles were found to be practically the same as in the corpuscles of adults. Certain differences were noted in the case of the plasma.—J. C. D.

1274. Über die Verteilung der Phosphate zwischen Blutkörperchen und Plasma innerhalb und ausserhalb des Organismus. P. Iversen (*Biochem. Zeit.*, 1921, **114**, 297-309).—Addition of Na_2HPO_4 to rabbit's blood *in vitro* causes a slow increase of the acid-soluble phosphate of the corpuscles, but the major portion remains in the plasma. *In vivo*, however, intravenous injection into a nephrectomised rabbit leads to an initial increase in the plasma content, but this falls off with simultaneous increase of the acid-soluble phosphate of the corpuscles until the proportion in the corpuscles is 2 or 3 times greater than in the plasma. The author thinks that this must be due to the formation *in vivo*, of non-ionisable compounds of the phosphate in the corpuscles.—H. K.

1275. Über den Blutkalk. M. Richter-Quittner (*Biochem. Zeit.*, 1921, **114**, 58-62).—A criticism of the work of previous observers on the calcium content of the blood. The author's own results show that, contrary to the results of other workers, corpuscles are free from calcium. No experimental details are quoted, but allied experiments are in hand.—H. K.

1276. The Lipoid Balance in the Blood. W. R. Bloor (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, vii-viii).—A preliminary note of the changes in the amounts of lipoids in blood following fasting, hæmorrhage, or injection of strong salt solutions. Lecithin and cholesterol tend to preserve a constant relationship to each other, whilst fat is much more variable.—J. C. D.

1277. Partition of Cholesterol between Blood-Corpuscles and Plasma. M. Richter-Quittner (*Wien. Arch. inn. Med.*, 1920, **1**, 425-54).—Under normal conditions, as in hypercholesterolæmia, the total cholesterol is evenly distributed between plasma and corpuscles; occasionally it is somewhat higher in the plasma in the latter circumstance. Under physiological or pathological conditions cholesteryl esters are not present in the blood-corpuscles of man, horse, ox, dog, cat, or rabbit. Under physiological conditions cholesterol is present entirely as esters in the plasma; small amounts of free cholesterol are also found in cases of pathological hypercholesterolæmia. Administration of fat, of a diet rich in cholesterol, or of the latter in the free state causes an increase in the cholesterol content of the blood, both as the free alcohol and its esters. Increased amounts of cholesteryl esters in the plasma are first observed, followed after some hours by an equilibrium. A portion of the cholesteryl esters passes from the plasma into the blood corpuscles and is immediately hydrolysed, since the presence of the esters can never be detected in the corpuscles. In the case of pathological hypercholesterolæmia, the free cholesterol is alone increased.—W. D. H. (*J. C. Soc.*).

1278. Über das Vorkommen und die Verteilung von Fetten und Lipoiden im Blute nach Blutentziehung. Chemische Beiträge zur Kenntnis des Lipämiegebietes—VII. J. Feigl (*Biochem. Zeit.*, 1921, **115**, 63-70).—A quantitative study of the lipæmia occurring after a considerable loss of blood. The observations were made on hospital patients, and on normal rabbits and guinea-pigs.—J. H. B.

1279. Serum Lipochrome. H. v. d. Bergh and P. Muller (*Proc. K. Acad. Wet.*, Amsterdam, 1921, **23**, 766-73).—2 c.c. of serum are precipitated with 2 c.c. of 96% alcohol, and the precipitate extracted with 2 c.c. of ether. The extract is examined colorimetrically against a standard potassium dichromate solution. Lipochromes from other sources may be estimated in the same way; but in serum containing bile-pigment the ether extract is first washed with a few drops of very dilute NaOH. The organ richest in lipochrome is the adrenal, then follow liver, fat, spleen, and blood last. In the blood the amount varies directly with that in the food; the value is high in diabetes,

probably on account of the diet. No relation of the amount to other diseases was found. —W. D. H. (*J. C. Soc.*).

1280. Über den Nachweis von occultem Blut in den Fäces. E. Adler (*Arch. f. Verdauungskrankh.*, 1921, **27**, 153-90).—Food which contains hæmoglobin must be abstained from for a few days before the test is made, but food which contains chlorophyll has no influence. The simplest and best method for practitioners is the benzidine test. Snapper's test (spectroscopic detection of pyridine hæmochromogen) is more exact. The differentiation between occult blood and hæmorrhoidal blood can be made by Snapper's method, using 2·5 to 5% HCl.—H. W.

1281. Action de l'hirudine sur les accidents anaphylactiques consécutifs à l'injection de sérum de cheval chez les cobayes préparés au moyen de le sérum. E. Zunz et Mme. M. Van Geertruyden-Bernard (*Réunion de la soc. belge de biol.*, Jan. 29, 1921, 287-8).—Si l'on injecte 2 à 4 milligrammes d'hirudine par voie intraveineuse à des cobayes préparés, par voie sous-cutanée ou intrapéritonéale, 2 à 3 semaines auparavant et qu'on ne procède à la réinjection de sérum de cheval que 1/2 à 4 heures après l'injection de l'hirudine, la dose minima sûrement mortelle de sérum de cheval s'accroît. Il en est de même si la réinjection a lieu au moyen d'un mélange de 2 milligrammes d'hirudine et de 7 centimètres cubes de sérum de cheval maintenu 3 à 4 heures en contact. L'atténuation des accidents anaphylactiques a aussi lieu pour les doses légèrement supérieures à la dose mortelle, mais pas pour les doses notablement supérieures à cette dernière. L'action atténuante de l'hirudine paraît être moindre pour les accidents anaphylactiques provoqués par la réinjection de sérum étranger que pour les effets nocifs de l'injection à un cobaye neuf de sérum homologue traité par l'agar.—E. Z.

1282. The Equilibrium between Hæmolytic Sensitiser and Red Blood-Cells in Relation to the Hydrogen-Ion Concentration. C. B. Coulter (*J. Gen. Physiol.*, 1921, **3**, 513-21). —In a salt-free medium, the proportion of sensitiser combined with cells reaches a maximum of nearly 100% at $P_H = 5{\cdot}3$, and a minimum of about 5% at $P_H = 10$. NaCl increases the proportion combined except in the neighbourhood of $P'_H = 5{\cdot}3$, where its effect is absent. There is a reversible equilibrium between that free and combined. The combination is related to the isoelectric point of the sensitiser, and undissociated molecules only of sensitiser combine with the cells.—W. M. B.

1283. Zur Biologie des Blutplasmas. H. Sachs and K. v. Oettingen (*Münch. med. Woch.*, 1921, **68**, 351-3).—The authors emphasise the importance of physical structure in blood-plasma. For example, Friedberger has produced anaphylatoxin by incubating fresh guinea-pig's serum with starch. Hence change of physical structure can lead to breakdown of a protective mechanism. The possible occurrence of such a breakdown within the body (*e.g.*, in pathological conditions) will depend on the "colloid stability" of the plasma proteins. The authors show that colloid stability in healthy subjects varies greatly between the extremes found on the one hand in pregnancy, and on the other in the blood of new-born infants. If citrate plasma from a pregnant woman is heated at 55° C. for 3 to 5 minutes, there is a dense precipitate, whereas in 75% of plasmas from infants only a trace of precipitate is seen. Similar differences occur with alcohol precipitation, and with partial saturation with NaCl or $(NH_4)_2SO_4$. Again, there are differences in surface tension and in rate of sedimentation of red cells. The authors arrive at the general conclusion that infant's blood is more colloid stable, and point out that it contains very little antibody.—J. H. B.

HEART

1284. Nature of Flutter and Fibrillation of the Auricle. T. Lewis (*Lancet*, 1921, i., 785-8, 845-8; *Brit. Med. J.*, 551-5, 590-3).—These Oliver-Sharpey lectures deal with the subjects mentioned in title, and which Dr. Lewis has made his own, as will be known to readers of these abstracts. To read an isolated paper by Lewis and his co-workers on this highly technical subject is a puzzle to physiologists unacquainted with the sequence of the research, but in these lectures the whole story is told clearly, so that he who runs may read, and the distinction between flutter and fibrillation, the meaning of the "ring experiment," "circus movement," "refractory period," etc., are lucidly explained and discussed. The second lecture deals with the commoner phenomenon (fibrillation) at length.—W. D. H.

1285. Effect of Vagus upon the Rate of Transmission of the Excitation Wave in the Dog's Auricle. T. Lewis, A. N. Drury, and H. A. Bulger (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xcix-c).—When rate of stimulation is maintained constant between 180 and 300 per minute, full vagal stimulation has no effect on rate of transmission in auricle, although it deeply affects conduction at the A.V. ring. At rates of over 300 the transmission interval becomes irregular and prolonged, and vagal stimulation will now reduce and regularise it, probably by reducing the refractory period. The lengthened and irregular transmission interval in auricles responding to high rates, and cases of auricular flutter are evidently of this nature.—M. L. W.

1286. Influence of the Vagus upon the Refractory Period of the Dog's Auricle. A. N. Drury, T. Lewis, and H. A. Bulger (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xcvii-viii).—The right auricle is kept stimulated by rhythmic break shocks giving a rate of about 200 per minute, and test shocks are sent in at same point from another secondary coil in series; a record is obtained from a string galvanometer. At this rate the refractory period is 0·06 second, in the atropinised heart 0·12 second, and with full vagal stimulation 0·02 second. Thus vagal stimulation increases the responsive period of the dog's auricle from 60 to 90% of the cycle. This shortening effect on the refractory period is in line with the weakening effect of the vagus on auricular contraction.—M. L. W.

1287. I. On the Fibrillation of the Heart. II. On Recurring Extra Systoles and their Relation to Fibrillation. S. de Boer (*J. Physiol.*, 1921, **54,** 400, 410).—Fibrillation of the frog ventricle can only be produced when the metabolism of the heart is abnormal. A bloodless heart fulfils this condition; a single stimulus applied to such a ventricle immediately after the refractory period (summit of the *T* deflection) will cause fibrillation. A consideration of the electrograms shows that the initial stimulus, falling during a period of low cardiac excitability, causes a small (local) contraction (accompanied by a brief refractory period) which is slowly propagated on account of the diminished conductivity of the ventricle. A series of small contractions therefore result, and after the excitation completes the circuit of the ventricle and returns to the starting-point, whose refractory period is already over, a second circuit is commenced, and so on. In digitalis poisoning, deformed systoles are met with. These are really complete systoles occurring in two or more stages (*i.e.*, they consist of the single "circuits" of delirium); they do not go on to fibrillation for the reason that the refractory period of the original stimulus is prolonged, and although there is poor conduction allowing of the fractionated systole, the block imposed at the starting-point prevents further progress. II. If the stimulus is sent in later during the *T* deflection, a series of recurring extra systoles is produced, while later still only a single extra systole results. The explanation is the same, and depends on the degree of recovery of the excitability and conductivity of the ventricular muscle.—R. K. S. L.

1288. Herzwuhlen, Flimmern, Flattern, gehaüfte Extrasystolie, paroxysmale Tachykardie. S. de Boer (*Pflüger's Arch.*, 1921, **187,** 193-232).—Principally an extension of work already published by the same author (Abstract No. 290, Vol. VI., p. 43; also preceding Abstract), but in too great detail for satisfactory abstraction.—C. L. E.

1289. Über den Einfluss von Bariumchlorid auf das Froschherz. S. de Boer (*Pflüger's Arch.*, 1921, **187,** 283-92; see also Abstracts Nos. 291 and 292, Vol. VI., pp. 43 and 44).—Halved rhythm is often seen. This can be converted into the normal rhythm by faradic stimulation at an appropriate moment. Alternation of beats occurs in a stage intermediate between normal and halved rhythm.—C. L. E.

1290. Removal of Sino-Auricular Node. J. A. E. Eyster and W. J. Meek (Proc., *Amer. J. Physiol.*, 1921, **55,** 316).—Partial removal (? animal) is followed in time by recovery of normal rhythm, complete removal after a period of auriculo-ventricular rhythm by the establishment of permanent coronary sinus rhythm. Other experiments and histological examination incline the authors to believe in separate paths of conduction between the sino-auricular and auriculo-ventricular nodes.—W. D H.

1291. The Action of Ions upon the Frog's Heart. I. de B. Daly and A. J. Clark (*J. Physiol.*, 1921, **54,** 367).—Lack of K and Na and excess of Ca all increase systolic tone, and the duration of the electric response. K has the most marked effect on the conduction of the electrical variation, while reduction of the Ca content or alteration of the P_H, have little effect. K and Ca are antagonistic as regard the mechanical response; with regard to the electrical response, they are either temporarily or only slightly antagonistic.—R. K. S. L.

1292. Blood-Pressure and Electrocardiogram in Oxygen Want. C. W. Greene and N. C Gilbert (Proc., *Amer. J. Physiol.*, 1921, **55,** 307-8).—In rebreathing tests on man or at high altitudes the heart-rate increases, and the P wave disappears or is inverted. Dogs gave similar results.—W. D. H.

1293. The Action of Carbon Dioxide on the Frog's Heart. W. Burridge (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xcviii).—Using a preparation 500 times more responsive to CO_2 than the ordinary Ringer-perfused fresh frog heart, it is found that CO_2 has an augmenting adrenaline-like action not due to its H-ion concentration, that without oxygen it depresses, and that the endocrine glands determine the degree and nature of the response.—M. L. W.

1294. Note on Antagonisms and Reinforcements. W. Burridge (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xc-xcii).—A table of the immediate and more gradual opposed effects on cardiac excitability of certain drugs is used, the cardiac response to Ca being the standard, to predict the relations between any 2. For example, Mg and Ca are shown to have two direct antagonisms and an indirect reinforcement, the immediate effect of Mg being to diminish the response to Ca, the gradual effect being to augment it.—M. L. W.

1295. The Auricular Heart-Sounds. W. D. Reid (*J. Amer. Med. Assoc.*, 1921, **76,** 928-9).—It is suggested that there are 5 heart-sounds—1st and 2nd auricular, 1st and 2nd ventricular, and the "third sound." The auricular sounds are, for reasons given, only audible in cases of heart-block.—C. L. E.

1296. Phases of Cardiac Cycle. C. J. Wiggers (Proc., *Amer. J. Physiol.*, 1921, **55,** 298).—Systole is divided into 3, and diastole into 5 phases for the purpose of studying drug action. Further details are promised.—W. D. H.

CIRCULATION

1297. Mikrocapillarbeobachtungen. Ein Beitrag zur pathologischen Physiologie des Kreislaufssystems. E. Jürgensen (*Dtsch. Arch. f. klin. Med.*, 1920, **132,** 204-18).—Observations on the capillary system in the skin of the terminal finger-joint, undertaken with the object of determining the influence of abnormalities in heart or vessels on the circulation. In recent cases of cardiac insufficiency the distinction between the narrow arterial portion of the capillary and the wider venous portion is easily made out; the difference of diameter disappears whenever the vascular tone is diminished. The degree of compensation of a circulatory disturbance is not to be judged from the rate of blood-flow through the capillaries, as this can be maintained in spite of even serious defects. During a gradual fall of pressure in a Riva-Rocci armlet, the capillary circulation is found to return before the radial pulse can be detected, except in subjects with abnormally high blood-pressures. In subjects showing increase of vascular tone or aortic insufficiency, a further reduction of pressure may lead to an emptying of the capillaries. When venous stasis is produced, a reversal of the capillary current may also be observed.—T. R. P. (*Ber. ü. d. Ges. Physiol.*).

1298. Capillary Pressure—II. L. Hill (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xciii-v).—A further note on the results to be obtained by the method of Roy and Graham-Brown and on the technique. Whereas a pressure of 20 to 35 cm. water is required to stop the arteriole flow in the frog web, 2 to 5 c.m. water-pressure momentarily applied checks the flow in the arterioles and chief capillary branches, where the velocity is rapid. And this, which is the true pressure, closely approximates to that which, continuously applied, would retard the flow in capillaries with slow velocity. An air manometer with xylol index is used to measure these momentary compressions. Results on frog web, mouse ear, and mesentery, and on cat's mesentery indicate that pressure in the arterioles with rapid flow is only equal to 2 to 5 cm. water, and therefore the fall of pressure from arteriole to venule is very slight. This negatives transudation hypotheses based on the assumption that capillary pressure is 30 mm. Hg. The errors in the method of estimation by making pale an area of skin are noted. (Compare Abstract No. 295, Vol. VI., p. 45.)—M. L. W.

1299. Capillary Circulation in Cat's Ear. D. R. Hooker (Proc., *Amer. J. Physiol.*, 1921, **55,** 315).—The cat's ear is superior to the frog for displaying the corpuscular flow microscopically to students.—W. D. H.

1300. Self-Adjustment of Blood-Pressure. W. A. Osborne (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** c-ci).—An attempt is made to see if, since rise of blood-pressure stimulates depressor vagus fibres and reflexly slows the heart, fall of aortic tension may not stimulate another series of fibres. The R. vagus of a dog is cut, and the distal end connected with a string galvanometer, but though rise of pressure gives a movement, a fall causes merely a return. The author finds that immediate effect of section of the depressor is to raise blood-pressure and quicken the heart-rate, and therefore argues constant action for the self-adjusting depressor mechanism.—M. L. W.

1301. Circulatory Stasis in Man. R. W. Scott (Proc., *Amer. J. Physiol.*, 1921, **55,** 298-9).—Diminished buffer value of blood is one factor in decompensation, but there are others. Digitalis is recommended. Of interest to clinicians.—W. D. H.

RESPIRATION

1302. Nerve Terminations in the Lung of the Rabbit. O. Larsell (*J. Comp. Neurol.*, 1921, **33,** No. 2).—Sensory nerve terminations are present in the epithelium of the primary intrapulmonary bronchi and at the points of division of the succeeding tubes.

The most distal points at which they have been found are the walls of the atria of the lung. The ganglionic cells within the lungs are surrounded by pericellular networks, the terminal processes of vagus fibres. These cells give off axons which are distributed to the smooth muscle of the bronchi. There is thus a typical preganglionic and post-ganglionic arrangement. The pulmonary artery and its branches, including the arterioles, have a rich innervation of unmyelinated fibres which terminate in relation to the smooth muscle cells of the tunica media. A few nerve fibres are also present in the walls of the pulmonary veins.—W. D. H. (*W. I.*).

1303. Visceral Sensory System. VI. Lung Automatism and Lung Reflexes in Cryptobranchus, with Further Notes on the Physiology of the Lung of Necturus. A. B. Luckhardt and A. J. Carlson (*Amer. J. Physiol.*, 1921, **55,** 212-22).—In cryptobranchus, the lungs are in maximal relaxation owing to inhibition through the vagi. Destruction of the bulb causes hypertonus, with a slight tonus rhythm. Under curare, stimulation of sensory nerves causes reflex lung contraction and cardiac inhibition, except that of the nares, in which case the latter is absent, and that of the ovaries, in which the former is absent. Electrical stimulation of the brain in necturus causes lung contraction by inhibition of the inhibitory centre. Neither $BaCl_2$, histamine, pituitrin, or adrenaline has any effect on the lung muscles of this animal. Ringer's solution causes contraction. —W. M. B.

1304. Readjustment of Peripheral Lung Motor Mechanism after Bilateral Vagotomy. T. L. Patterson (Proc., *Amer. J. Physiol.*, 1921, **55,** 283).—The operation produces hypertonus of this mechanism in the frog, which renders the lung useless as a respiratory organ. Readjustment begins 12 to 21 days later, but never culminates in complete recovery. Nevertheless, the frogs, if well tended and fed, will live on indefinitely. —W. D. H.

1305. Effects of the Restriction of the Pulmonary Artery on the Blood-Pressure and on the Volume of Some Organs, and the Cause of the Fall of the Arterial Blood-Pressure due to the So-called "Paradoxical Vasodilatory Substances." K. Abe (*Tohoku J. Exp. Med.*, 1920, **1,** 398).—Histamine, peptone, organ extracts, and blood-sera constrict the pulmonary bloodvessels more markedly than those of the systemic, and thus cause a fall of the systemic blood-pressure; venous pressure rises, and venous stasis accounts for the increase in volume of various organs. It is also stated that histamine (and probably the others) acts partly on the bronchial musculature in bringing about the pulmonary depressor effect; hence anæsthetics may affect the blood-pressure changes. (The author is unaware of Dale and Richard's work; see Abstract No. 1867, Vol. III., p. 334.)—R. K. S. L.

1306. Vagal Apnœa. W. J. Meek (Proc., *Amer. J. Physiol.*, 1921, **55,** 282).—In dogs a given number of blasts into the lungs produces apnœa; this number is not enough if both vagi are cut, but it is if a weak faradic stimulus is applied to the central end of the vagus with each blast. Short periods of apnœa are obtainable if the air contains 6, 7, or even 10% of CO_2. A nervous factor is present in apnœa; the vagi are the chief pathways, but possibly other sensory nerves may act in the same way.—W. D. H.

1307. Beiträge zur Physiologie und Pathologie der Atmung. I. Die Atmung des Säuglings. A. Eckstein and E. Rominger (*Zeit. f. Kinderheilk.*, 1921, **28,** 1-37).—The respiration rate of the normal suckling infant (1 year old) is 37 to 49 per minute. In pneumonia the rate is greater. The volume of the tidal air of young infants is 10 to 13 c.c.; it increases at the end of the first half-year to 18, and at the end of the second half-year to 30 c.c. In intestinal intoxication it is higher, and in pneumonia less. Typical fluctuations of the frequency and volume whether the suckling is awake or sleeps could never be found after longer observations. It is increased by crying. The "absolute volume of respiration" is in the first year 600 to 1,000 c.c. per minute, with alimentary

intoxications and pneumonia higher. The relative volume of respirations per minute and kg. is higher than in adults. Many other details in health and disease are given.—H. W.

1308. A Study of Low Oxygen Effects during Rebreathing. E. C. Schneider and Dorothy Truesdell (*Amer. J. Physiol.*, 1921, **55,** 223-57).—Results of tests on aviators; 46·7% of the cases belonged to the fainting type, the rest to the non-fainting. Special examination and computation of correlations showed that the respiration is the primary and the circulation the secondary factor in compensation. Numerical details are given.—W. M. B.

1309. Der respiratorische Gaswechsel bei Gesunden und Kranken. Rolly (*Zeit. f. d. ges. exp. Med.*, 1921, **12,** 143-60).—Description of an apparatus (after Benedict) for short or long experiments in animals or men. Not only the respiratory quotient, but also the total metabolism can be measured with it. The values found correspond with the real conditions.—H. W.

1310. Variations in Alveolar Carbon Dioxide Pressure in Relation to Meals. E. C. Dodds (*J. Physiol.*, 1921, **54,** 342).—The alveolar CO_2 rises (2 to 6 mm.) 30 to 45 minutes after a meal, and falls an equal amount in about 2 hours, to return to the normal level in 3 hours or so. This diphasic change is directly associated with the digestive processes, for only the fall occurred in a subject who had 7/8 of his stomach removed.—R. K. S. L.

1311. Oxygen Consumption during Repeated Slight Hæmorrhages in Dogs. H. H. Schlomowitz, Ethel Ronzone, and B. H. Schlomowitz (Proc., *Amer. J. Physiol.*, 1921, **55,** 288-9).—There is no marked decrease until the blood lost is 15 to 25% of the original amount. At this stage there are also increased respiratory rate, reduced alkaline reserve, hyperglycæmia, decrease in cardiac output, and decreased oxygenation of tissues.—W. D. H.

1312. The Gastric and Respiratory Response to Meals. T. I. Bennett and E. C. Dodds (*Brit. J. Exp. Pathol.*, 1921, **2,** 58-65).—Studied by gastric analysis and by estimation of alveolar CO_2 tension, normal men are found to fall into 4 classes. (1) Cases showing achlorhydria during gastric analysis show a curve of alveolar CO_2 tension similar to that obtained in patients following gastrectomy. Such cases show a fall in alveolar CO_2 tension at a later period, indicating normal secretion during the later processes in digestion. (2) Cases of hyperchlorhydria have sometimes been found to show changes in alveolar CO_2 tension following meals which exceed what have previously been considered physiological limits. (3) Some cases occur in which upper alimentary digestion is so rapid as to be only demonstrable by observations taken at very short intervals. (4) Cases which yield a high gastric acidity during digestion are usually found to show a relatively high tension of alveolar CO_2 even during the "resting" phases of the stomach; in cases of achlorhydria the reverse is seen.—W. D. H.

1313. Deglutition Apnœa. C. A. Clark (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxix).—Experiments were carried out to determine the duration of reflex apnœa in deglutition. The respiratory pause for a single act of deglutition was usually less than 2·5 seconds, and not more than 3·5 seconds; 0·5 second was the lowest recorded. The pause was usually shorter during the swallowing of liquid than solid, and was not influenced by the normal respiratory rate. A larger percentage of acts of deglutition occurred during the expiratory phase, especially with solid food. The respiratory movement was resumed, after the apnœic pause, at the point at which it had been arrested. The few exceptions showed an interrupted inspiration followed by expiration.—I. F.

1314. Absorption Curve of Hæmoglobin and Carbon Dioxide. G. A. Buckmaster (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** xcii-iii).—Solutions of gas-free hæmoglobin of 12·8% were subjected to pressures of CO_2 from 0 to 98 mm. at 37° C., and found to obey the Dalton-Henry law. They absorb a slightly smaller amount than red blood-

cells of the same hæmoglobin content. Large amounts are absorbed between 40 and 60 mm. pressure, and on reduction of pressure the CO_2 is rapidly lost.—M. L. W.

1315. Die Reaktionstheorie der Atmungsregulation. H. Winterstein (*Pflüger's Arch.*, 1921, **187,** 293-8).—Arguments in favour of the hypothesis that the respiratory ventilation is regulated by the H-ion concentration of the respiratory centre itself. Even if the blood is more alkaline, as it may be in oxygen lack, owing to excessive ventilation, the cells of the centre still respond only to change of H-ion.—C. L. E.

1316. Effects of Anoxæmia on the Respiratory Centre in Decerebrate Animals. Lois McP. Fraser, R. S. Lang, and J. J. R. Macleod (*Amer. J. Physiol.*, 1921, **55,** 159-74).—In decerebrate cats, hyperpnœa is manifest as soon as the percentage of oxygen in the respired air has fallen to 17 by rebreathing through soda-lime bottles. It increases as the oxygen falls to 9 or 11%. Below this, the centre rapidly becomes paralysed. Arterial pressure does not rise until after the maximum hyperpnœa has been reached. No definite changes in the CO_2 of the blood were present in some experiments, but a decrease in others. Thus, acapnia is not always present, and cannot be assumed to be responsible for the effects.—W. M. B.

1317. Periodic Breathing and Oxygen Administration in Decerebrate Cats. J. J. R. Macleod (*Amer. J. Physiol.*, 1921, **55,** 175-83).—Periodic breathing can frequently be produced in decerebrate cats by periodic compression of cerebral arteries, by breathing through tubes of soda-lime, by increasing dead space, or by breathing 8 to 12% of oxygen. Arterial pressure shows waves synchronous with those of respiration. They are more marked than the latter, and may occur when these are not to be detected. In several cats in which natural respiration was inadequate, normal breathing was established by giving oxygen through a catheter into the trachea.—W. M. B.

1318. Concentration of Lactic Acid in the Blood in Anoxæmia and Shock. J. J. R. Macleod (*Amer. J. Physiol.*, 1921, **55,** 184-96).—Lactic acid is increased in the blood in acute anoxæmia within 10 minutes, in more gradual anoxæmia in 17 to 20 minutes. Return to normal is relatively slow. The amount of lactic acid is not related to the degree of stimulation of the respiratory centre. It may have the function of neutralising the increased alkali due to the hyperpnœa. But it may also be present when CO_2 accumulates owing to obstruction of the trachea. Shock caused by manipulation of the duodenum caused increase of lactic acid, but not until the blood-pressure had fallen to 40 mm. Hg and respiration was impaired. It is not the cause of shock, but is the result of low blood-pressure and defective respiration.—W. M. B.

1319. The Alkali Reserve of the Blood of Certain of the Lower Vertebrates. J. B. Collip (*J. Biol. Chem.*, 1921, **46,** 57-9).—There is considerable variation in the alkaline reserve, both in different species and of different members of the same species. An acid-base transfer between the red cells and the plasma with varying CO_2 tension is manifested in lower vertebrates' blood.—J. C. D.

1320. On the Stability of the Acid-Base Equilibrium of the Blood in Normal and in Naturally Nephropathic Animals. W. de B. MacNider (*Science*, 1921, N.S., **53,** 141-3).—In animals naturally nephropathic after anæsthesia, the alkali reserve may be normal. But if HCl or $NaHCO_3$ is given intravenously, there is a greater and more prolonged disturbance of the alkali reserve than occurs in normal animals similarly treated.—C. L. E.

1321. The Acid-Base Exchange between the Plasma and the Red Blood-Cells. J. B. Collip (*J. Biol. Chem.*, 1921, **46,** 61-72).—Confirmatory evidence is given of the acid-base transfer between the red cells and the plasma of the serum of vertebrate blood with fluctuating CO_2 tension. Evidence is presented to show that part of the alkali of the blood is bound by an organic substance with the functions of a weak acid. The hypothesis that sodium bicarbonate rather than CO_2 combinations with proteins is the transporting vehicle for CO_2 in the body is supported.—J. C. D.

1322. Second Wind. R. G. Pearce (Proc., *Amer. J. Physiol.*, 1921, **55,** 291).—During "second wind," the minute volume of the circulation is greater in proportion to the O_2 consumption than it is before the onset.—W. D. H.

ALIMENTARY CANAL

1323. The Metabolism of the Salivary Glands. I. The Relation of the Chorda Tympani to the Nitrogen Metabolism of the Submaxillary Gland. G. V. Anrep (*J. Physiol.*, 1921, **54,** 319).—Chorda stimulation increases the nitrogen output of the gland. The mucin fraction is derived from the gland itself, and represents about 1/5 of the total N of the resting organ. The non-mucin fraction is transferred by the active gland from lymph to saliva, and forms the only nitrogen component of the saliva in the later stages of secretion (*i.e.*, after the gland has exhausted itself of its mucin). There is therefore no building up of new mucinogen during chorda stimulation.—R. K. S. L.

1324. The Sulphocyanate of the Saliva and Urine in Pellagra. M. X. Sullivan and P. R. Dawson (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xlii).—This is as a rule less in patients about to be discharged as cured than in cases in which the disease is active.—J. C. D.

1325. The Parotid Gland in Japanese. C. Ogawa (*Amer. J. Phys. Anthrop.*, 1920, **3,** No. 4).—There is no appreciable difference in the volume of the parotid in the Japanese and Europeans, and no marked difference was noticed in its general form.—W. D. H. (*W. I.*).

1326. Physiology of the Stomach. LIII. Secretory Response of the Gastric Mucous Membrane to Water and Saline Solutions. G. F. Sutherland (*Amer. J. Physiol.*, 1921, **55,** 258-76).—Intravenous injection of water or salt solutions in dogs increases gastric secretion. Water introduced into the stomach has more effect than into the small intestine. The presence of food increases the secretory response to water in the stomach or intestine. The gastric glands respond better when in relative activity than when at rest. It is suggested that the effect is one of general tissue reaction to hydræmia.—W. M. B.

1327. Röntgenologische Beobachtungen über die Anatomie und Physiologie der Kardia. J. Palugyay (*Pflüger's Arch.*, 1921, **187,** 233-42).—A good view of the cardia and lower part of the œsophagus can be obtained in patients lying on the back with the pelvis raised so that the body has an inclination of 45° with the horizontal; the rays are passed in a postero-anterior direction. A further advantage of this posture is that the passage of food through the sphincter is so slowed down that its progress may be observed. The form of the stomach, the position of the cardia, and the passage of food along œsophagus and cardia, as deduced from 100 subjects in this position, are described. The cardia appears never to remain open, even in the empty stomach. but only opens for a brief interval to allow food awaiting admittance to pass in from the œsophagus. As the stomach fills up, small peristaltic waves from the cardia along the greater curvature are to be seen.—C. L. E.

1328. Changes in the Blood after Pyloric Obstruction in Dogs. A. B. Hastings, C. D. Murray, and H. A. Murray (*J. Biol. Chem.*, 1921, **46,** 223-32).—There is a marked increase in the CO_2 combining power of the blood and a striking fall in the concentration of chlorine after closure of the pylorus. Other changes noted were increases in the concentration of Ca, S, and P in serum, and a fall in that of Na in 2 out of 3 cases. These results are discussed, and the blood-changes are attributed to an exaggeration in duration and extent of the alkaline tide occurring normally after meals.—J. C. D.

1329. The Hydrolysis of Sucrose in the Stomach of Man. H. B. Lewis and R. M. Hill (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxx-xxxi).—The hydrolysis

appeared to be due entirely to the acidity of the gastric juice, and not to the action of regurgitated intestinal sucrase.—J. C. D.

1330. Gastric Motility in Turtle. Z. Bercovitz and F. T. Rogers (Proc., *Amer. J. Physiol.*, 1921, **55,** 310).—Faradisation of the vagus causes contraction of the stomach, but the effects weaken as the stimulation is repeated. Single shocks are ineffective, and slowly interrupted shocks (1 per second) cause relaxation.—W. D. H.

1331. Movements of Empty Stomach in Necturus. T. L. Patterson (Proc., *Amer. J. Physiol.*, 1921, **55,** 283).—Contractions are practically continuous, as in the bull-frog, but their type and rate resemble those of the turtle. The movements are inhibited by weak acid or alkali in the stomach or by irritation of the gills.—W. D. H.

1332. Gastrin. A. C. Ivy (Proc., *Amer. J. Physiol.*, 1921, **55,** 306-7).—Experiments on a dog with a Pavloff pouch did not confirm the gastrin theory of Edkins.—W. D. H.

1333. The Influence of Bile-Salts upon Gastric Function. C. A. Pannett and C. M. Wilson (*Brit. J. Exp. Pathol.*, 1921, **2,** 70-4).—It is shown experimentally in cats and man that the addition of a small quantity of sodium taurocholate to a test meal is followed by an abnormally rapid evacuation of the stomach contents.—W. D. H.

1334. (1) The Duodenal Segment as a Standard Reagent. (2) Intestinal Stimulation by Sodium Carbonate. F. S. Hammett (*Amer. J. Physiol.*, 1921, **55,** 404-13, 414-21).—(1) The segment from rat is recommended for pharmacological and similar standardisation. The standard test fluid is 0·1 *M* sodium carbonate, which gives very uniform results. (2) Excitation by the carbonate is neural; in normal rats on vagal, in excited rats on splanchnic terminals—*i.e.*, in both cases the extrinsic supply is concerned.—W. D. H.

1335. Stimulation of Intestine by Sodium Carbonate. F. S. Hammett (Proc., *Amer. J. Physiol.*, 1921, **55,** 309).—Rat's duodenum in Tyrode's solution shortens when 0·1 *M* sodium carbonate is added. This does not occur when cocaine is added first, but nicotine makes no difference. The carbonate is therefore supposed to act on nerve fibres or nerve endings.—W. D. H.

1336. Über Kochsalzresorption im unteren Dünndarm. R. Cobet (*Biochem. Zeit.*, 1921, **114,** 33-57).—The author claims to have shown (1) that the intestine wall does not allow water to pass into the lumen of the intestine by osmosis; (2) that the lower part of the small intestine can take up NaCl without simultaneously absorbing water. He fills the intestine of an anæsthetised dog with a solution of 12% $MgSO_4$ and 0·6% NaCl. After leaving it for half an hour he analyses the solution then present. He finds an increase in the total volume of fluid, and in the lower loops of the small intestine a diminution in the absolute amount of NaCl. The increase of fluid, he says, is due to an increased secretion of digestive juices; it is not osmotic, because the increased volume is not proportional to the concentration of the solution first placed in the intestine.—J. H. B.

1337. Beiträge zur Physiologie der Leber. III. Das Verhalten der Leber bei Glykogenmast. P. Junkersdorf (*Pflüger's Arch.*, 1921, **187,** 269-82).—By excessive feeding with protein and carbohydrate the glycogen content of the liver in the dog may reach 16·4%; there is no exact proportion between weight and glycogen content of liver. The fat and glycogen contents of the liver vary inversely; the water content also falls as the glycogen increases. The liver may show an increase in weight (*e.g.*, 12·4% of body-weight) up to 3 or 4 times that of the normal; this is partly a hyperplasia and partly due to protein storage in the cells.—C. L. E.

1338. Stickstoff und Fettstoffwechsel bei einem Fall von angeborenem Gallengangverschluss. E. Friese (*Monatssch. f. Kinderheilk.*, 1920, **18,** 515-20).—In a 7 months' old infant with congenital obstruction of the bile-duct the utilisation of the fat and nitrogen of the milk diet was found to be much reduced.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1339. Recherches expérimentales sur la persistance de la stercobiline malgré l'obstruction du canal cholédoque. M. Brulé (*Compt. rend. soc. biol.*, 1920, **83**, 1390-1).—In dogs with closed bile-duct no stercobilin could be found in the fæces and no bilirubin or urobilin in the urine. But when jaundice had set in, these substances were excreted by the large intestine. (See also Abstract No. 2218, Vol. V., p. 352.)—T. R. P. (*Ber. ü. d. ges. Physiol.*).

DIET AND FOODS

1340. Quality of Protein in Nutrition. R. H. A. Plimmer (*Lancet*, 1921, i., 947-9).—Short account of a lecture recently given at Royal Institution. It is a useful review of the main facts.—W. D. H.

1341. Amino-Acids in Nutrition. III. Is Proline a Growth-Limiting Factor in the Protein of Peas? B. Sure (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xxxiii-iv).—Proline is apparently not the limiting factor. It is possible that zein contains undiscovered amino-acids essential for growth.—J. C. D.

1342. Digestibility of Proteins in Vitro. I. The Effect of Cooking on the Digestibility of Phaseolin. H. C. Waterman and C. O. Johns (*J. Biol. Chem.*, 1921, **46**, 9-17; *Proc.*, xli).—Preliminary work on a method for the comparison of protein digestibilities is described. The experiments indicate that phaseolin is rendered more digestible by boiling with distilled water.—J. C. D.

1343. The Nutritive Value of the Proteins of Pisum sativum. C. O. Johns and A. J. Finks (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xxii-vi).—The proteins of this pea are adequate for normal growth in rats, and do not require supplementing with cystine, as in the case of the proteins of phaseolus.—J. C. D.

1344. The Available Carbohydrate in Thrice-Boiled Vegetables. L. O'Reilly and E. H. McCabe (*J. Biol. Chem.*, 1921, **46**, 83-9).—It is difficult to remove the last trace of available carbohydrate from vegetables. Addition of small amounts of sodium bicarbonate assists the extraction.—J. C. D.

1345. A Method for the Utilisation of the Nutritive Salts of Sea-Water. J. F. McClendon (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xxvii).—Six gms. of phosphoric acid are added to a litre of ocean-water, and the whole evaporated to dryness. The product is non-hygroscopic, and useful for supplying iodine and fluorine in small quantities.—J. C. D.

1346. Powdered Spinach and Sea Salts in the Diets of Adults and Infants. J. F. McClendon and J. P. Sedgwick (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46**, xxvii-viii).—The preparation of these products and their value is considered.—J. C. D.

1347. Rhubarb Leaves. G. Maue (*Z. Nahr.-Genussm.*, 1920, **40**, 345-50).—Illness is undoubtedly due to eating rhubarb leaves. The oxalates therein are made soluble by the gastric acid, but the amount is too small to be toxic. Perhaps the saponin in the leaves is responsible.—W. D. H. (*Chem. Abstr.*).

1348. Nutrition Studies. V. Value of Soy-Bean Flour. C. O. Johns and A. J. Finks (*Amer. J. Physiol.*, 1921, **55**, 455-61).—Bread made of wheat flour 75 to 85 and soy-bean flour 15 to 25% contains adequate protein and vitamin B for normal growth in rats. These mixtures are 2 to 3 times more efficient than proteins from wheat alone.—W. D. H.

1349. Lecithin. III. The Fatty Acids of the Egg Yolk. P. A. Levene and I. P. Rolf (*J. Biol. Chem.*, 1921, **46**, 193-207).—Oleic, palmitic, and stearic acids only were found. Evidence is presented pointing towards the assumption of the existence of more than 1 lecithin in egg yolk.—J. C. D.

1350. Glucose of Hen's Eggs. J. S. Hepburn and E. Q. St. John (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xlviii).—Whole eggs contain 0·36 to 0·5%. The white contains more than the yolk (figures given). Details are also set out for preserved eggs and bad eggs.—W. D. H.

1351. The Animal Utilisation of Pentose. E. W. Rockwood and K. G. Khorozian (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xiv).—The utilisation of xylose in various types of animals is markedly modified by variations in the diet, being greatest on a diet low in carbohydrates.—J. C. D.

1352. Famine Foods in Ahamedabad. G. J. Pathak (*Agr. J. India*, 1920, **15,** 40-5).—New materials which have been utilised as famine food are *Bid*, the rhizomes of the sedge *Scirpus kysoar; Thek*, the rhizomes of the sedge *Cyperus bulbosus; Poli* or *pan*, or the inflorescence of *Typha angustata;* and the tubers and fruits of *poyana* (*Nymphæa stillata*). *Bid* contains about 70 digestible carbohydrates and 8 to 10% protein. When used for human food, the clods dug from the soil containing the rhizomes are left unbroken until thoroughly dried. The plant grows naturally in salt land. When properly dried and roasted it is used as a flour, as a substitute for wheat. *Poyana* is the common water-lily of the *nal.* For food the tubers are roasted in ashes in the same manner as potatoes, or are boiled as vegetables. The seeds are used as a flour. The dried tubers contain about 68 digestible carbohydrates and 15 proteins, the seed 70 carbohydrates and 11% protein.—W. D. H. (*Chem. Abstr.*).

1353. Bracken Rhizomes and their Food Value. J. Hendrick (*Chem. News*, 1920, **121,** 320-2; 1921, **122,** 5-7).—The rhizomes of the bracken—a pest in Scotch pastures—have the following composition: H_2O, 71·10 to 70·19; Et_2O ext., 0·23 to 0·26; proteins, 19·38 to 17·09; fibre, 6·17 to 6·03; and ash, 1·93 to 2·55%. Preliminary tests with hogs, cattle, and chickens indicate that the rhizomes are too poor in food to be of much use. They are not palatable to chickens, and even hogs will not eat them unless very hungry.—W. D. H.

1354. Natural and Artificial Digestion of Crude Fibre. W. Thomann (*Mitt. Lebensm. Hyg.*, 1920, **11,** 227-37).—Studies were made of the crude fibre of wheat straw and cooked straw, the NaOH used being neutralised in one case and washed out in the other. The fibre by Weender's method contains pentosans and lignin besides pure cellulose, but it differs with the type of feed. This method destroys a little cellulose. The Cross and Bevan method gives more fibre and more constant results than the other method. The fibre contains ash, much pentosans, but little lignin. Digestibility by a wether was compared with artificial digestion following the method of Mach and Lederle, and the following respective percentages were obtained on corn-germ grits 100 to 95·72, hay 59·87 to 54·36, raw straw 47·49 to 46·23, neutralised cooked straw 70·34 to 68·80, washed cooked straw 75·31 to 75·35. Comparisons are discussed showing that for crude fibre the artificial digestibility by the method of Mach and Lederle compares with the natural function of cattle.—W. D. H. (*Chem. Abstr.*).

1355. Hydrocyanic Acid in Sudan Grass and its Effect on Cattle. C. O. Swanson (*J. Amer. Soc. Agron.*, 1921, **13,** 33-6).—No harm resulted to cattle when HCN was found in Sudan grass used for pasture. Liberation of HCN is apparently associated with enzyme action. Digestion in water at room temperature and then distillation gave larger amounts of HCN than if H_2SO_4 was added at once. Slow drying caused the HCN to disappear. Making Sudan grass into silage did not diminish the HCN. Frosted Sudan grass, when tested immediately, gave very large amounts of HCN, but it rapidly disappeared when the plant began to wilt; when dry, the HCN had disappeared. While the Sudan grass used in this experiment was not harmful to cattle, although it gave a strong test for HCN, 1 case is reported where cattle were apparently poisoned by Sudan grass.—W. D. H. (*Chem. Abstr.*).

1356. Cotton-Seed Meal and Kernels as Food. I. G. Macy and N. M. Alter (Proc., *Amer. J. Physiol.*, 1921, **55,** 304).—Rabbits, mice, guinea-pigs, and pigeons fed on diets of these materials, roughage and vitamins being also given, declined in weight and died with lesions in various organs.—W. D. H.

VITAMINS

1357. Die akzessorischen Nährstoff-Faktoren. I. Zum Sondernährwert verschiedener Nahrungsfette. H. Aron and R. Gralka (*Biochem. Zeit.*, 1921, **115,** 188-203).—The authors, by protracted feeding experiments on rats, show that certain fatty foods possess a special nutritive value independent of their calorific value. The accessory food factor responsible is not connected with the taste or with the amount of food consumed. Butter, cod-liver oil, or the fat of egg yolk, together with a basal diet, are each capable of supporting vigorous and healthy growth over lengthy periods, whilst omission of these fats or replacement by margarine lead to loss of weight and death. (Ancient history.—W. D. H.)—H. K.

1358. Vitamin A. H. Steenbock, M. T. Sell, G. M. Nelson, and M. V. Buell (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxii-iii).—The association of yellow pigmentation with the A vitamin is again indicated. Carotene of constant melting-point induced growth in rats after inhibition on a diet deficient in the vitamin A. This is not taken to mean that the vitamin is a pigment, since the pigment content of butters is not always an indication of their vitamin value (see recent paper, Drummond and Coward Abstract No. 2976, Vol. V., p. 474). The vitamin appears to be destroyed by light, and is resistant to saponification with hot alkali. Oxidation with hydrogen peroxide, or reduction with nascent hydrogen, had no destructive influence (see, however, Abstracts Nos. 392, 393, 394, Vol. VI., p. 60). Crystalline acetyl derivatives of constituents in the non-saponifiable vitamin fraction have been prepared without loss of activity.—J. C. D.

1359. Ophthalmia associated with a Dietary Deficiency in Fat-Soluble Vitamin (A). Isabel M. Wason (*J. Amer. Med. Assoc.*, 1921, **76,** 908-12).—The histological findings were hyalinisation or necrosis of the outer layer of corneal epithelium, exudation of serum and cells in epithelium and stroma, and proliferation of bloodvessels and fibroblasts. In advanced cases the chambers may be involved, the course being largely determined by the type and virulence of the organisms of secondary infection.—C. L. E.

1360. Ophthalmia and Diet. T. B. Osborne and L. B. Mendel (*J. Amer. Med. Assoc.*, 1921, **76,** 905-8).—In experiments on 1,000 unselected rats, xerophthalmia was only seen in animals with deficient fat-soluble vitamin; in this group the incidence was 50%, most of the cases developing before any marked decline in body-weight had occurred. Administration of vitamin A (*e.g.*, 0·1 grm. butterfat per day) caused disappearance of the eye disorder, even though in some cases the animal subsequently died.—C. L. E.

1361. The Etiology of Rickets. D. N. Paton (*Brit. Med. J.*, 1921, i., 594).—See following abstract.—W. D. H.

1362. Etiology of Rickets. D. N. Paton and A. Watson (*Brit. J. Exp. Pathol.*, 1921, **2,** 75-94).—In young dogs under laboratory conditions a liberal allowance of milk fat, up to even 14 grm. per kilo of body-weight, does not prevent the onset of rickets. Pups kept largely in the open air may escape the development of rickets on an intake of less than 1 grm. of milk fat per kilo of body-weight. With scrupulous care as to cleanliness it is, at least sometimes, possible to rear pups free of rickets in the laboratory on an intake of only about 0·5 grm. of milk fat per kilo of body-weight, along with

bread, provided that the diet affords an adequate supply of energy. The energy value of the diet, however supplied, quite apart from the presence of any hypothetical antirachitic factor in milk fat, would seem to play a part in controlling the development of rickets; but that it is only a contributory part is shown by the development of rickets in pups with a high energy intake if confined in the laboratory without such care. Milk fat may be reduced to about 0·3 grm. per kilo of body-weight, if its place is taken by an equal amount of lard, without the onset of rickets. These observations give no support to the conclusion that rickets is a deficiency disease due to a lack of an antirachitic factor in the diet.—W. D. H.

1363. Vitamins and Yeast Growth. J. R. Williams (*J. Biol. Chem.*, 1921, **46,** 113-8).—The quantitative yeast method for estimating the vitamin B gives results fairly concordant with rat-feeding experiments, as made by Osborne and Mendel. It is possible that vitamin C may stimulate yeast growth.—J. C. D.

1364. The Nutritional Requirements of Yeast. III. The Synthesis of Vitamin B by Yeast. V. E. Nelson, E. I. Fulmer, and R. Cessna (*J. Biol. Chem.*, 1921, **46,** 77-81).—Evidence is presented that yeast can synthesise vitamin B.—J. C. D.

1365. Supposed Identity of the Water-Soluble Vitamin B and Secretin. G. V. Anrep and J. C. Drummond (*J. Physiol.*, 1921, **54,** 349).—Experiments are described which show conclusively that the idea is groundless.—R. K. S. L.

1366. Las vitaminas en el metabolismo de la levadura. H. Damianovich and M. A. Catán (*Anales Inst. Modelo Clinica Med.*, 1920, **5,** 98).—Pour doser le facteur B les auteurs utilisent le méthode de Williams, mais au lieu de compter les cellules de levure, ils mesurent la quantité de sucre consommé. Le facteur B résiste 15 minutes à 120° à 130°.—B. A. H.

1367. Influencia de las vitaminas en la alimentación con carne cocida. H. Damianovich and M. A. Catán (*Anales Inst. Modelo Clinica Med.*, 1920, **5,** 105).—Les chiens succombent si on les alimente avec de la viande qui a été cuite pendant 3 heures, surtout quand préalablement on l'additione de carbonate sodique; mais ils survivent si on ajoute de la levure de bière ou de l'autolisé de levure.—B. A. H.

1368. A Stable Silver Vitamin Compound from Yeast. A. Seidell (*Pub. Health Rep., U.S. Pub. Health Service*, 1921, **36,** 665-70).—Brewer's yeast is autolysed for 48 hours and treated with fuller's-earth. It is filtered, and the filtrand, which contains the antineuritic vitamin, is washed and dried. By further suitable treatment, which is described in detail, an ammoniacal $AgNO_3$ precipitate is obtained which consists of an easily crystallisable non-vitamin fraction and a non- (or difficultly-) crystallisable fraction. These have been separated. The yield from "activated" fuller's-earth is 0·23%. The compound is slightly soluble in water, is unchanged on drying, and contains, by ignition, 54·85% Ag. This Ag fraction may be a mixture. Administration of 0·002 mg. per diem prevented the onset of polyneuritis in pigeons on a rice diet for 6 weeks. This was the duration of the experiment.—J. A. H.

1369. Vitamins in Feed and Milk Produced. J. S. Hughes, J. B. Fitch, and H. W. Cave (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** l).—Two cows were fed on vitamin-rich and vitamin-poor diet at different times. The milk during the latter periods contained less vitamin A and B, but no difference was noticeable in vitamin C (antiscurvy).—W. D. H.

1370. Vitamins of Honey. P. B. Hawk, C. A. Smith, and O. Bergeim (*Amer. J. Physiol.*, 1921, **55,** 339-48).—See Abstract No. 384*a*, Vol. VI., p. 59).—W. D. H.

1371. Avian Beri-beri. G. M. Findlay (*J. Path. and Bact.*, 1921, **24,** 175-91).—An investigation, experimental and histological, on fowls and pigeons. The histological changes in birds fed with polished rice are similar to those in inanition, except that nuclear degeneration, chromatolysis of the cells of the central nervous system, and

retention of lipoid in the adrenal cortex occur in the former. The author finds that the nucleic acid and vitamin B content of the organs of the ox are related quantitatively, and that vitamin B is an essential factor in the synthesis of animal nucleic acids of the body.—W. E. G.

1372. Cooking and Vitamins. Ellen M. Delf (*Sci. Progress*, 1921, **15,** 601-12).—A useful summary of previously published work. The antiscorbutic vitamin is the one most injured by heat, and prolonged or overheating should be avoided.—W. D. H.

1373. Experimental Infantile Scurvy. M. Segawa (*Tokyo Igakukai Zasshi*, 1918, **22,** No. 20, 1-36; *Jap. Med. Lit.*, 1920, **5,** 39).—Guinea-pigs, which were fed on a proprietary infant food for 2 to 3 weeks, developed the lesions which are typical of human infantile scurvy.—W. D. H. (*Chem. Abstr.*).

1374. Drying of Cabbage and Scurvy. A. Holst and T. Frolich (*J. Trop. Med. Hyg.*, 1920, **23,** 261-3).—Thin slices dried for a week in an incubator at 37° C. (dried by P_2O_5) keep their antiscorbutic power at 37° in vacuum bottles for 18 to 26 months. If treated with $CaCl_2$ instead of P_2O_5, they lose it sooner, unless the temperature is reduced to 4° to 12°.—W. D. H.

1375. The Antiscorbutic Properties of Commercially Dried Orange Juice. J. F. McClendon, W. S. Bowers, and J. P. Sedgwick (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** ix-x).—The product possessed good potency when tested on guinea-pigs. It retained its antiscurvy properties when rendered free from vitamin B, colloids, citric acid, and Ca.—J. C. D.

1376. The Commercial Drying of Orange Juice retaining its Antiscorbutic Properties. J. F. McClendon and S. M. Dick (Proc. Amer. Soc. Biol Chem., *J. Biol. Chem.*, 1921, **46,** x-xi).—The construction of the desiccating plant is described; also the drying of the juice. The preparation may be added to dried milk to restore the anti-scurvy vitamin.—J. C. D.

1377. The Antiscorbutic Property of Desiccated Fruit Juices. M. H. Givens and I. G. Macy (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xi-xii).—These were prepared by a commercial process. The majority retained their antiscorbutic potency. Dried orange juice is active after 2 years' storage.—J. C. D.

METABOLISM

1378. Basal Metabolism Determinations with the Original Portable Benedict Apparatus. G. W. McCaskey (*J. Amer. Med. Assoc.*, 1921, **76,** 978-82).—The apparatus is preferred to other forms, since the results are accurate, the apparatus simple, and the danger of infecting patients easily obviated. A simple method of calculating results is given.—C. L. E.

1379. Variation and Constants of Basal Metabolism in Men. J. A. Harris and F. G. Benedict (*J. Biol. Chem.*, 1921, **46,** 257-79).—It is necessary to adopt standards (1) of physiological condition, (2) of the unit to express caloric output, and (3) of a method to obtain statistical constants. Under (1) complete repose in the post-absorptive stage is the usual one adopted; the authors find here variations of about 4% in the same person, and the amount of variation is related to the time occupied in the observation. The statistical portion of the paper must be read in the original, consulting the tables provided.—W. D. H.

1380. Monographic Charts for Metabolic Rate Estimations. W. M. Boothby and R. B. Sandiford (Proc., *Amer. J. Physiol.*, 1921, **55,** 296).—Charts for computing metabolic rate (heat production) from the data of indirect calorimetry.—W. D. H.

1381. A Four-Hour Metabolism Period. I. The Elimination of Urinary Nitrogen and Chlorine in Normal Men and Women. C. F. Nelson and M. Kinney (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxiii-iv).—The elimination of total N, urea, uric acid, creatinine, and NaCl in 9 healthy individuals was measured over 4-hour periods at irregular intervals varying from 3 weeks to 9 months. The variations encountered were not large, and the practicability of using a standard test meal and a 4-hour metabolism period for tests of renal function is being investigated.—J. C. D.

1382. Die zahlenmässige Beurteilung des Ernährungszustandes durch Indices. R. Wagner (*Zeitsch. f. Kinderheilkunde*, 1921, **28,** 38-50).—Pirquet's Gelidusi index (Abstract No. 424, Vol. VI., p. 65) is preferable to Rohrer's.—H. W.

1383. Nutritional Work in Public Schools; Final Report of Experimental Work done under the Supervision of the Board of Education in the Public Schools of Chicago. K. B. Rich (*J. Amer. Med. Assoc.*, 1921, **76,** 998-9).—50% of the school-children investigated were below the normal weight or height.—C. L. E.

1384. Physiological Cost of Walking in and out of Training. A. D. Waller and G. de Decker (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxxi-iii).—The observations were carried out upon Dr. E. Lüscher, who is a sedentary worker during the session and a strenuous walker and climber during vacation. The test work consisted in a horizontal walk 30 times round a garden at approximately 4 miles per hour. Samples of expired air were collected at every fifth lap. Although Dr. Lüscher weighed heavier and walked faster in his trained state, yet the cost of work or CO_2/kg.M. ratio was distinctly lower.—I. F.

1385. The Physiological Cost of Collier's Work. A. D. Waller and G. de Decker (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, lxii-iv).—Observations were made hourly upon 2 colliers during the morning shift on 3 successive days. The procedure was to collect expired air for 30 seconds each hour from each of the 2 colliers at the coal face, with least possible interruption of the work, which consisted of "getting coal" and loading it. The volume of expired air and CO_2 % were measured at once. As the wage depended upon the tonnage got, the work was maximal (4·5, 4·0, 3·5 tons for 3 days). The pulse was taken during the collection of expired air. Curves are given which show a parallelism in the rising and falling ordinates which represent CO_2 discharge and pulse frequency. The physiological cost of walking 60 paces horizontally before 7 a.m. and after 2 p.m. was found to be doubled after the 7 hours of work.—I. F.

1386. Die Beziehungen und Einflüsse der Chlorose auf das Wachstum des weibliche Organismus während der Entwicklungsperiode. H. Sommerfeld (*Zeit. f. angew. Anat. und Konstitutionslehre*, 1921, **7,** 402-4).—Chlorosis does not produce an effect on growth; this is contrary to the theory of Tandler, who regards chlorosis as a symptom of premature precipitate evolution of growth, followed by an untimely stop. He investigated the length of the body and the gaping of the epiphysis lines by means of X rays.—H. W.

1387. Über den Einfluss von CO_3, Cl, PO_4 Ionen auf die Oxydationsvorgänge im Tierkörper. R. Bing (*Biochem. Zeit.*, 1921, **113,** 210-30).—Numerous experiments are described of the effect on the respiratory quotient of feeding a dog with a standard diet to which varying portions of salts have been added. The conclusions drawn are that in the resting animal a deficiency of salts increases the energy requirements of the body; deficiency of salts in the body increases the respiratory quotient after a carbohydrate meal more than if the normal mixture of cations is added with the food. Addition of the mixture of cations increases the respiratory quotient in the fasting animal.—H. K.

1388. The Synthesis and Elimination of Hippuric Acid in Nephritis. F. B. Kingsbury and W. W. Swanson (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** iv-v).—The dosage is usually 2·4 gm. of sodium benzoate or the equivalent of sodium hippurate.

The normal individual will excrete 90 to 100% of the hippuric acid within 3 hours. The excretion is markedly slower in nephritis. More evidence is brought out that the kidney has little to do with the synthesis of hippuric acid.—J. C. D.

1389. Synthesis of Hippuric Acid. IV. In the Rabbit after Exclusion of Bile from the Intestine. H. B. Lewis (*J. Biol. Chem.*, 1921, **46,** 73-5).—Hippuric acid synthesis occurs in the rabbit after exclusion of bile from the intestine. Glycocholic acid is not the only source of glycine.—J. C. D.

1390. Ornithuric Acid Formation in Starving Hens. T. Suga (*Kyoto Igaku Zasshi*, 1919, **15,** 225-9; *Jap. Med. Lit.*, 1920, **5,** 46).—Starving hens (unlike well-fed birds) are unable to synthesise hippuric acid from benzoic acid and glycine; they conjugate ingested benzoic acid with ornithine into ornithuric acid, and excrete the latter compound.—W. D. H. (*Chem. Abstr.*).

1391. The Oxidation of Cystine in the Animal Body. H. B. Lewis and L. E. Root (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxv).—Evidence on the metabolism of cystine and phenyluramino-cystine suggests that the oxidation of the sulphur portion of the cystine molecule is probably connected with the process of deamination or with the oxy-acid products of deamination.—J. C. D.

1392. Fate of Phenylacetyl Derivatives of the Amino-Acids in the Animal Organism. C. P. Sherwin and G. J. Shiple (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxvi-vii).—Phenylacetyl derivatives of alanine, leucine, and tyrosine undergo little change when administered, but phenylacetyl glutamine undergoes partial hydrolysis. —J. C. D.

1393. Beitrage zum Kreatininstoffwechsel—III. M. Bürger (*Zeit. f. d. ges. exp. Med.*, 1921, **12,** 1-27).—Febrile hypercreatinuria and creatininuria occur even if the fever is of short duration, or if the temperature is raised artificially. In repeated febrile attacks, the amounts excreted are less in the later attacks. The author considers that the main underlying cause is a better circulation through the muscles.—W. D. H.

1394. Creatinuria. E. G. Gross and H. Steenbock (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxvii).—Arginine administration causes increased excretion of creatine. Cystine also has this action, but here it is apparently due to the resultant acidosis. Sodium acetate administration prevented the cystine creatinuria, but not that following doses of arginine.—J. C. D.

TEMPERATURE

1395. Spread of Temperature Changes. N. B. Taylor (Proc., *Amer. J. Physiol.*, 1921, **55,** 318-9).—Temperatures were recorded by thermo-electric needles, one on the surface and another at a distance. Warmth (45° C.) was applied to the shaved surface of a rabbit, and the rise of temperature noted. In one case there was a rise of 1·5° in the second needle 20 cm. off; in another in abdominal viscera, where heat spreads more readily, the rise was 5·5°, the distance from the warmed surface being 7·5 cm. In no case did the general body temperature rise.—W. D. H.

1396. Tiefenthermometrie—VI. B. Zondek (*Münch. med. Woch.*, 1921, **68,** 300-2). —Evidence that a cold compress can raise the subcutaneous temperature to an extent inversely proportional to the thickness of the subcutaneous fat. Maximum rise observed, 1·4° C. in 3 hours.—J. H. B.

1397. Increased Oxidation following Ingestion of Fats, Fatty Acids, and Alcohols. Decrease of Oxidation during Starvation. Increased Oxidation after Fertilisation during Youth, and Decreased Oxidation in Old Age. W. E. Burge and J. Leichsenring (Proc., *Amer. J. Physiol.*, 1921, **55,** 299-304).—All explained by variations in catalase.—W. D. H.

1398. Beiträge zur Kenntnis der chemischen Wärmeregulation der Säugetiere. II. Über künstlich erzeugte winterschlafähnliche Zustände an Mäusen. Z. Aszódi (*Biochem. Zeit.*, 1921, **113**, 70-88).—An artificial state analogous to hibernation, of short duration, 16 hours at the most, is produced in white mice by lowering sufficiently the temperature of the surroundings. The 2 states are qualitatively identical, but show quantitative differences.—H. K.

1399. Über die Bedeutung der abnormen respiratorischen Quotienten im Winterschlaf und beim Erwachen aus demselben. P. Hári (*Biochem. Zeit.*, 1921, **113**, 89-98).—The author considers that Aszódi's results (previous abstract) affirm the theory of glycogen formation in hibernation.—H. K.

1400. Heat Production during the Action of Enzymes. B. Inouye (*Tokyo Igakukai Zasshi*, 1918, **32**, 1-34 (1918); *Jap. Med. Lit.*, 1920, **5**, 44).—During proteolysis, on the average, 0·17 small calories of heat is produced for each mg. of amino-N. The amount of heat is proportional to the increase in the number of molecules in the digestion mixture. A mixture of 2 proteases produces from 1·4 to 1·6 times the sums of the amounts of heat and of proteolysis (measured by the formol titration) produced when each enzyme acts separately. During the hydrolysis of urea by urease 79·2 small calories are produced for each g. of substrate decomposed. During the enzymic hydrolysis of 1 g. of maltose 4·66 calories are produced, and during the alcoholic fermentation of 1 g. of glucose 134·9 calories.—W. D. H. (*Chem. Abstr.*).

SUGAR AND DIABETES

1401. Blood-Sugar. 1. In Dog Fish and Sand Shark. E. L. Scott. **2. In Frog.** E. L. Scott and N. Kleitman. **3. In Pigeon.** E. L. Scott and Hannah E. Honeywell (*Amer. J. Physiol.*, 1921, **55**, 349, 355, 262-5).—(1) Sugar is in subnormal states of *Mustelus canis* absent from the blood. It is raised by asphyxia. It normally is about the same as in dogs and cats. Much the same is true for the sand shark. (2) The average amount is 37 mg. per 100 c.c. From February to April it is higher in females, except when the ovaries are poorly developed. The onset of the breeding season in males makes but little difference. The percentage rises on exposure to cold. (3) Like other birds, the pigeon has high blood-sugar (185 mg. per 100 c.c.). The amounts in oxalated and defibrinated blood are the same.—W. D. H.

1402. Wie ist die Verteilung der Glucose zwischen den roten Blutkörperchen und der ausseren Flussigkeit zu erklaren? R. Ege (*Biochem. Zeit.*, 1921, **114**, 88-110).—Contrary to the findings of Masing and of Kozawa, analysis and osmotic experiments prove that the corpuscles of the dog are impermeable to glucose. This also applies to the goat, ox, and rabbit. Similar experiments show that the red corpuscles of man are permeable, but chemical analysis indicates that the glucose content of the corpuscle does not run parallel with the results of osmotic (hæmatocrite) experiments, the latter indicating a much lower glucose content. This is due to preliminary absorption of the glucose on the corpuscular surface, followed by a slow inward diffusion. The conclusions are supported by numerous experiments.—H. K.

1403. Über die Permeabilität der menschlichen Blutkörperchen für Traubenzucker nach Untersuchungen am ungeronnenen Blut von Hämophilen. M. Bürger (*Zeit. f. d. ges. exp. Med.*, 1921, **12**, 161-7).—In hæmophilia, the sugar content of the plasma remains constant, but that of the red corpuscles is high and inconstant; they lose sugar in contact with the plasma, and according to the activity of their glycolytic enzyme. The coagulation factor has no effect.—H. W.

1404. Specific Dynamic Action of Glucose and of Adrenaline Chloride. W. M. Boothby and Irene Sandiford (Proc., *Amer. J. Physiol.*, 1921, **55,** 293-4).—Observations on patients, most of whom had hyperthyroidism (but that factor is not regarded as important). Ingestion of 100 gms. of glucose increased heat production 9 and blood-sugar 101%. After injections of adrenaline chloride the 2 figures were 20 and 37. This is regarded as due to a specific dynamic action of adrenaline which causes body cells to metabolise more quickly, and that it is not due to carbohydrate plethora; sugar mobilisation, however, provides an abundance of ready fuel which increased metabolism demands.—W. D. H.

1405. The Liver as Regulator of Glucose in Blood. F. C. Mann and T. B. Magath (Proc., *Amer. J. Physiol.*, 1921, **55,** 285-6).—After removal of the liver of dogs and geese, the blood-sugar falls till death occurs. Injection of glucose is temporarily beneficial. If the pancreas is also removed the fall in sugar is more rapid.—W. D. H.

1406. The Mechanism of the Ketolytic Action of Glucose. P. A. Shaffer (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** vi-vii).—Evidence is presented to show that the effect of glucose in inhibiting the appearance of the acetone bodies is due to a chemical reaction between some derivative or oxidation product of glucose and aceto-acetic acid; this compound is readily oxidisable.—J. C. D.

1407. Kreatinurie und Acidose bei Diabetes. M. Lauritzen (*Zeit. f. klin. Med.*, 1921, **90,** 376-85).—Defective carbohydrate metabolism is the common cause of acidosis and creatinuria. Creatinuria sometimes appears earlier than the acidosis.—H. W.

1408. Plasma Chlorides and Œdema in Diabetes. R. M. Wilder and C. Beeler (Proc., *Amer. J. Physiol.*, 1921, **55,** 287-8).—In diabetes the absolute Cl content of the plasma is often lowered; more frequent is a relative lowering of the plasma Cl in relation to the rate of urinary Cl excretion—*i.e.*, there is a low renal threshold for Cl. The determining factor in œdema is inanition.—W. D. H.

1409. A Case of Renal Glycosuria. A. P. Lothrop (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xliii-iv).—A medical student, apparently healthy, excreted 12 gm. of glucose per diem. It disappeared on restricted diet. It is regarded as a "renal" case.—W. D. H.

KIDNEY

1410. Mechanism of Renal Secretion. E. J. Stieglitz (*Amer. J. Anat.*, 1921, **29,** No. 1).—This study was carried out by tracing the course of intravenously injected ferric ammonium citrate through the kidney from the blood-plasma into the urine, detecting the iron at various time intervals as Prussian blue. Iron was found to be secreted by the convoluted tubules, and never seen in the glomerular spaces. There is an accumulative retention within the cells with multiple injections. This retention of iron progressively inferfereswith the further secretion of iron onsubsequent injections, and also reduces the renal output of phenolsulphonephthalein. During the period of iron elimination, the urine decreases in volume and in specific gravity, with a reduction in the carbonates, demonstrating an inhibitory activity of the iron. This inhibition is explained on the basis of the effect of ferric iron on the hydration capacity of body colloids, which effect interferes with the passage of the solvent, water, and therefore its solutes, particularly as the iron promptly becomes intracellular in the secreting cells. The inhibition or antidiuresis is not due to blood-pressure changes. Experimental tubular nephritis interfered markedly with iron secretion. The concentration of the

urine is probably carried out chiefly by tubular secretion, rather than by any process of reabsorption of water and some salts.—W. D. H. (*W.I.*).

1411. Kidney Blood-Flow and Urinary Constituents. E. K. Marshall, junior, and Marian M. Crane (Proc., *Amer. J. Physiol.*, 1921, **55,** 278-9).—A continuation of work by Marshall and Kolls (Abstract No. 2477, Vol. IV, p. 396). The urinary constituents fall into 3 groups: (1) Water, chloride, and carbonate, which are markedly affected by increase of blood-flow. (2) Urea, sulphate, and phosphate, which are affected in less degree. (3) Creatinine, ammonium, and sulphonephthalein, which are not affected. Clamping the renal artery does not cause anuria, but after a time protein is present. Group 1 is not affected, or may even be increased; groups 2 and 3 are reduced in amount. Secretion of CO_2 was examined, and primary and secondary phosphates, the proportion being calculated from H-ion concentration. The 2 phosphate ions fall into different groups.—W. D. H.

1412. The Passage of Urea through the Cells of the Tubules of the Kidney of the Frog. J. A. Menzies (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxvi-vii).—Starting from Cushny's view that the kidney tubules absorb water and certain solids, but do not secrete any of the urinary constituents, the author perfused the frog's aorta with oxygenated Ringer's solution under a pressure of 24 cm. water, and also the renal portal veins with Ringer's solution containing 0·02% urea under pressure of 12 cm. water. The urine always contained urea. When both glomeruli and intertubular vessels were perfused with Ringer's solution alone, the urine contained no urea. The kidneys lost the œdematous appearance (to which they were liable) on addition of 2% gum to the perfusing solutions.—I. F.

1413. Factor's governing the Rate of Excretion of Urea. J. H. Austin, E. Stillman, and D. D. Van Slyke (*J. Biol. Chem.*, 1921, **46,** 91-112).—The rate of excretion of urea per unit of body-weight in a normal dog or man increases approximately (*a*) in simple direct proportion to the blood-urea concentration, and (*b*) in proportion to the square root of the rate of volume output of urine per unit of body-weight, as long as the volume rate remains within ordinary limits. The observed relationships are expressed in the equation $\frac{D}{W} = KB\sqrt{\frac{V}{W}}$, or $K = \frac{D}{B\sqrt{VW}} = 7{\cdot}5 \pm 3$ (for normal man), D being the urea output (gm. per 24 hours time unit), B the blood-urea in gm. per litre, V the volume output in litres per 24 hours, W the body-weight in kilos, and K the excretory constant. Special cases of this equation exist outside certain limits. Ambard's first law, $\frac{D}{B^2} = K$, when C is constant, is a special case of the above equation. His second law, $D\sqrt{C} = K$, when B is constant, is inconsistent with the new formula. The use of a creatinine ratio rather than a time ratio is suggested to obviate errors due to time measurement.—J. C. D.

1414. Rate of Nitrogen Elimination. H. O. Pollock and W. S. McEllroy (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxiv-v).—Dogs were fed on lean beef; urine and blood were collected at intervals, and in them total N and urea N estimated. The curves of these figures in the urine were parallel respectively to those of the non-protein N and urea N in blood. Variations are attributed to variations in rate of alimentation and absorption.—W. D. H.

1415. Influence of Phenylcinchoninic Acid, Salicylic Acid, and Some of their Derivatives on Renal Excretion. V. C. Myers and J. A. Killian (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xvii-viii).—The results indicate that the action of these drugs on the kidney is not absolutely specific for uric acid.—J. C. D.

1416. Renal Lipase. V. E. Levine and S. A. Gianelli (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxiv-v).—Bile inhibits the action of this lipase, an action due

to the bile salts. The order of mixing the reagents is very important in studying the action of this enzyme. Blood contains a pro-enzyme for this lipase.—J. C. D.

1417. Experiments on Ureters. G. B. Wislocki and V. J. O'Conor (Proc., *Amer. J. Physiol.*, 1921, **55,** 316-7).—Partial ligature of a dog's ureter increases its diameter and its muscle. Spontaneous peristalsis and antiperistalsis are seen months later, or can be elicited by pinching or by a crystal of $BaCl_2$. If the ligature is complete, the lumen is still greater and muscle hypertrophies; no spontaneous movements occur, and excitation is usually non-effective. Isolated muscle bands contract in Locke's solution. Experiments on the passage of glass beads down ureters are also described. If the bead sticks, peristalsis becomes vigorous, but antiperistalsis does not occur spontaneously.—W. D. H.

URINE

1418. Isolation of Citric Acid from Normal Urine. S. Amberg and M. E. Maver (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xv-vi).—Details of the method are given in full.—J. C. D.

1419. The Adaptation of the Pentabromacetone Method to the Estimation of Citric Acid in Urine. W. D. McClure (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xvii).—Certain errors of the pentabromacetone method are pointed out, and modifications outlined.—J. C. D.

1420. Elimination of Silicic Acid in the Urine after its Administration. F. Zuckmayer (*Ther. Gegen.*, 1920, **61,** 344-50).—Various preparations were given. Elimination occurred most rapidly when the preparation given was freshly prepared colloidal silicic acid solution. Simultaneous administration of chalk delays elimination.—W. D. H. (*J. C. Soc.*).

1421. Über Ursachen von Variationen in der Reaktion des normalen menschlichen Urins. J. Holló (*Biochem. Zeit.*, 1921, **113,** 246-54).—By titration of urine to phenolphthalein and to alizarine the author shows that after intravenous administration of acid or alkaline phosphates there is an increase in the excretion of the acid salts.—H. K.

1422. Urinary Excretion and Blood-Picture of Hibernating Frog. H. C. v. d. Heyde (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xlv-vi).—The author expresses surprise so little is known about frog's urine, and announces that he is collecting data for future work on hibernation.—W. D. H.

1423. Rapid Estimation of Protein in Urine. H. C. Bradley and W. Elliott (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xlv).—The protein is digested with boiling NaOH, decomposed quickly, and the sulphide titrated in acid solution by standard iodine. Time consumed, 15 to 20 minutes, and the figures agree well with those obtained by estimating total N.—W. D. H.

1424. Vorschlag eines Ganges für die qualitative Analyse des Eiweisskörper des Harnes. E. Cavazzani (*Wien. klin. Woch.*, 1921, 121-2).—Description of methods for investigating the different protein substances in urine.—H. W.

1425. Specific Precipitin for Bence-Jones Protein. L. Hektoen (*J. Amer. Med. Assoc.*, 1921, **76,** 929-30).—Detection by an antiserum after removal of ordinary proteins from the urine by precipitation with antihuman serum appears to be quite feasible. —C. L. E.

1426. Cholesterol and Lecithin in Chylous Urine. M. Sano (*Tohoku J. Exp. Med.*, 1920, **1,** 448).—The greater portion (65 to 81%) of the cholesterol found in 2 chylous urines was present as esters. Lecithin was also isolated from these urines.—R. K. S. L.

1427. Über Harnkolloide und Stalagmone. H. Pribram and F. Eigenberger (*Biochem. Zeit.*, 1921, **115,** 168-74).—An account of stalagmometric experiments on urine in disease, with special reference to Schemensky's results.—H. K.

1428. Die Stalagmone. H. Bechhold and L. Reiner (*Münch. med. Woch.*, 1920, **67,** 891-2).—Substances in urine which lower the surface tension. In pathological conditions the amount is increased. Their degree of dispersion is greater than that of proteins; some are probably albumoses and peptones. The authors regard their presence as proof of changes in protein metabolism. (See also Abstract No. 2992, Vol. V., p. 476.) —J. H. B.

SKIN

1429. Hydrogen-Ion Concentration of the Sweat. G. A. Talbert (Proc., *Amer. J. Physiol.*, 1921, **55,** 287).—The sweat collected in rubber jackets shows an increase in H-ion concentration. That from legs has higher acidity than from other parts. CO_2 is a negligible factor.—W. D. H.

1430. La " perspiratio insensibilis " attraverso le cicatrici cutanee e la cute di arti paretiei. G. Musumeci and G. Di Macco (*Lo Sperimentale*, 1920, **74,** 252-73).—The insensible perspiration through lupus scars is smaller than through the normal skin, and appears to take place by means of a simple process of diffusion of water through the layers of the newly formed connective tissue. On the skin of paretic limbs the insensible perspiration is greater than normal. Section of the sciatic nerve and its degeneration in consequence of a central lesion cause in rabbits an increase of insensible perspiration in the corresponding limbs. This excretion of water through the skin of paretic limbs appears to occur by a simple process of diffusion, and without any participation of the sweat glands.—C. d. F.

1431. Beobachtung der Schweissdrusenausführungsgänge mit den Kapillarmikroskop. W. Parrisius (*Münch. med. Woch.*, 1921, **68,** 232).—Direct observation of the processes of sweat secretion at the root of the finger-nail described.—J. H. B.

1432. Das Problem der Schweissdruseninnervation und seine Bedeutung für die Klinik. E. Billigheimer (*Münch. med. Woch.*, 1921, **68,** 325-7).—A theoretical paper. The author is satisfied of the existence of inhibitory sweat nerves, and thinks that sweating may be of 2 kinds: (*a*) Sympathetic; (*b*) parasympathetic (" vagus "). He describes a patient suffering from a vegetative neurosis who sweated spontaneously morning and evening on the right side of the body, but when given pilocarpine sweating began on the left side. Cases of excessive sweating on 1 side of the body are explained by lack of normal inhibitory impulses on that side; he makes a comparison with decerebrate rigidity.—J. H. B.

1433. Neue Untersuchungen über den Wasserhaushalt der Frösche. J. K. Parnas (*Biochem. Zeit.*, 1921, **114,** 1-11).—A communication of work done by St. v. Przylecki during 1906-19, hitherto only published in Polish. This worker disproves Overton's contention that the frog's skin is impermeable to salts. A frog placed in 0·8% KCl does not escape poisoning because its skin is impermeable to KCl, but because the kidney excretes the KCl immediately it is absorbed. If the cloaca is blocked the excreted KCl can be found in the lumen of the gut, and can be used to kill another frog when injected subcutaneously. Frogs sitting in a sugar solution show a glycosuria and a blood-sugar percentage of 2·5. Intravenous injections of salts into frogs bring out the fact that in no case can the frog kidney produce urine of higher molecular concentration than the blood. Na_2SO_4 was injected intravenously into frogs, some of which were left in water, and some kept in a dry place. Those left in water excreted the Na_2SO_4 in a large quantity of very dilute urine. Those kept dry excreted some, but not all, of the Na_2SO_4. The concentration of this in the urine was greater than in the urine of frogs left in water, but it was always less than the concentration in the blood. These facts are held to confirm the findings of Bainbridge, Menzies, and Collins, and to support Cushny's view.—J. H. B.

1434. Pharmakologische Wirkungen am peripheren Gefäss-apparat und ihre Beeinflussung auf Grund einer Permeabilitatsänderung der Zellmembranen durch Hydroxylionen. W. Jacobj (*Münch. med. Woch.*, 1921, **68,** 385-6).—See Abstract No. 537, Vol. VI., p. 82.—W. D. H.

ENDOCRINE SYSTEM

1435. The Determination of Iodine in the Blood and Tissues. E. C. Kendall (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xx).—Thyroxin contains 65% of iodine. The relation of this to the iodine content of the thyroid gland and other tissues is considered.—J. C. D.

1436. Biochemistry of Iodine. IV. The Effect of Thyroxin on Growth in White Rats and Rabbits. A. T. Cameron and J. Carmichael (*J. Biol. Chem.*, 1921, **46,** 35-52).—Thyroxin administered by the mouth appears to produce the same qualitative effects as desiccated thyroid, but they are less marked.—J. C. D.

1437. Specific Dynamic Action of Thyroxin. H. S. Plummer and W. M. Boothby (Proc., *Amer. J. Physiol.*, 1921, **55,** 295-6).—The experiments (on man) support the conclusion that thyroxin catalytically increases the metabolic rate by aiding oxidation.—W. D. H.

1438. The Comparative Effects of Thyroid and of Iodide Feeding on Growth in White Rats and in Rabbits. A. T. Cameron and J. Carmichael (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxiv-vi).—With a system of accurate dosage based upon the changing body-weight of the animal, thyroid feeding caused decrease in the rate of growth; hypertrophy of heart, liver, and kidneys, occurs and depends upon the iodine content of the thyroid given. Sodium iodide containing the same amount of iodine as the thyroid given produced no effect on rate of growth and no hypertrophy; 2 cases of tetany in young rats occurred after heavy feeding with thyroid for 50 days. Desiccated thyroid gland did not appear to deteriorate with age. Thyroid feeding increased the effect of vitamin deficiency. It is suggested that the decrease in the rate of growth and the hypertrophy of heart, liver, etc., might be used as tests for the efficiency of thyroid preparations.—I. F.

1439. Zur Frage der Änderung des histologischen Aufbaues der Thyreoidea. A. Trautmann (*Virchow's Arch.*, 1920, **228,** 345-65).—In the goat, removal of the thyroid does not affect the parathyroids, but leads to a hypertrophy of accessory thyroids.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1440. Thyro-parathyroidectomy in Sheep. S. Simpson (Proc., *Amer. J. Physiol.*, 1921, **55,** 281).—Five experiments, some complete, others incomplete. When the operation was really complete, death resulted; when incomplete, the animals lived. In only 1 case was acute tetany present, and that months after the operation. All the sheep were pregnant; in the fatal cases there was abortion of dead fœtuses.—W. D. H.

1441. Parathyroid Hypofunction. A. C. Massaglia (Proc., *Amer. J. Physiol.*, 1921 **55,** 317-8).—Removal of 2 or 3 parathyroids (in dogs and cats) produces no symptoms unless the toxic material they neutralise is increased, then tetany results. Such increase may be the consequence of pregnancy, impaired kidney or liver function, poisoning by P or Pb, or by muscular fatigue. Parathyroid hypofunction in pregnancy produces a tetanic syndrome similar to eclampsia. In eclamptic women a lack in number of Sandstroem's glands and severe lesions of parathyroids were found. In such cases treatment with parathyroidin gave good results.—W. D. H.

1442. Relation of the Nervous System to the Parathyroids. F. S. Hammett (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xx).—Removal of the parathyroids

resulted in a bigger mortality in " untamed " rats than in a control group of " tamed " rats. These results are interpreted as being primarily due to differences in stability of nervous system and the effect of this upon the glands.—J. C. D.

1443. Observations on Parathyroidectomised Dogs. A. B. Hastings and H. A. Murray (*J. Biol. Chem.*, 1921, **46,** 233-56).—The previously observed Ca deficiency in parathyroidectomised dogs is verified, but no support is found for theories based on a disturbed acid-base equilibrium. The relationship between tetany and the relative concentration of certain ions in the blood is discussed.—J. C. D.

1444. Zur Frage der kleinen Thymusrindezellen. M. Pinner (*Frankfurter Zeit. f. Path.*, 1920, **23,** 479-98).—The small cells of the cortex of the thymus are shown to be lymphocytes on cytological, experimental, embryological, and pathological grounds.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1445. Experimentelle Studien zur Konstitutionslehre. I. Die Beeinflussung minder veranlagter, schwächlicher Tiere durch Thymusfütterung. B. Romeis (*Münch. med. Woch.*, 1921, **68,** 420-2).—By thymus feeding under-developed, feeble, and partly malformed tadpoles become strong normal frogs.—J. H. B.

1446. Changes in the Adrenals and Thyroid from Inanition. S. Vincent and M. S. Hollenberg (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxix-lxxi).—An increase in adrenaline occurs in the early stages of inanition, and a decrease in the later stages. In previous work the relative strengths of extracts were determined by observing the rise of blood-pressure on intravenous injection. In the present series the amount was determined chemically by the method of Folin, Cannon, and Denis. Both methods pointed to the same conclusion. The effect of inanition was found to be temporary, as restoration of normal weight following a period of 12 days' starvation resulted in no hypertrophy, and a return of adrenaline content to normal. The thyroids hypertrophy during starvation, while their colloid substance was deficient or absent. No explanation of this is offered.—I. F.

1447. Adrenalectomy and Metabolism in Cats. J. C. Aub, J. Forman, and Elizabeth M. Bright (Proc., *Amer. J. Physiol.*, 1921, **55,** 293).—The complete operation (3 experiments) causes, after a preliminary rise in basal metabolism, a fall of 25% after 48 hours, which was maintained until the animals were killed 3 days later.—W. D. H.

1448. Note sur le développement de la surrénale du Hérisson. C. da Costa (*Compt. rend. soc. biol.*, 1920, **83,** 878-9).—A rudiment of the cortex of the suprarenals of the hedgehog can be recognised in embryos 5·5 mm. long; it appears as a thickening of the epithelium of the cœlom, penetrating into the mesenchyme on both sides of the root of the mesentery. The relation of this rudiment to the Wolffian body is very clear. The rudiments from the sympathetic which give origin to the medulla can be recognised in embryos of 5 mm. They appear as small nests of cells near the 2 aortæ. Syncytial " protosympathetic " strands are formed soon afterwards, and if the preparations are made by a reduced silver method the penetration of sympathetic elements into the adrenal rudiments can be observed in embryos of 8 mm.—C. d. F.

1449. Effect of the Injection of Small Amounts of Adrenaline Chloride on the Blood. R. S. Hubbard and F. R. Wright (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xiii).—It was found that accompanying the decrease in CO_2 combining capacity of the plasma there was an increase in both the acetone bodies. This increase was not related to the changes in sugar concentration.—J. C. D.

1450. Der Einfluss von Hinterlappenextract der Hypophyse auf die Wasserabscheidung der Magenwand. H. Hoffmann (*Zeit. f. d. ges. exp. Med.*, 1921, **12,** 134-42).—The total quantity of the gastric fluid was considerably increased after pituglandolin injections (healthy persons) by the secretion of a weak fluid, which was nearly free from enzyme, protein, and mucus. The HCl concentration is diminished and the HCl may disappear.

This dilution of the gastric fluid is not caused by the action of the glandular cells of the gastric mucous membrane, but by a secretory action of the endothelium of the capillaries. In rare cases this result does not occur.—H. W.

1451. Pituitrin as Diuretic. O. O. Stoland and J. H. Korb (Proc., *Amer. J. Physiol.*, 1921, **55,** 305-6).—Various methods are held responsible for the divergent opinions on the diuretic effects of pituitrin. In the present experiments in a dog, care was taken that the conditions were as normal as possible. The diuretic effects of the drug were undoubted and marked.—W. D. H.

1452. Pigment Changes following Removal of the Epithelial Hypophysis and the Pineal Gland in the Frog Tadpole. W. J. Atwell (*Endocrin.*, 1921, **5,** 221-32).—The " silvery " tadpole is produced by the early removal of the epithelial portion of the hypophysis. It is light-coloured because its deep melanophores are contracted and because its epidermal melanophores and free melanin are reduced. It has a metallic lustre because its xantholeucophores are expanded. When the silvery tadpole is temporarily darkened by the action of posterior-lobe extracts, the deep melanophores expand. There is in some cases a contraction of the xantholeucophores, but this is never complete. The epidermal melanin is not restored. Removal of the pineal gland alone does not produce a pigmentary disturbance in the frog tadpole. Removal of the pineal soon after the removal of the epithelial hypophysis does not prevent the silvery reaction characteristic for the removal of the hypophysis alone.—W. D. H.

1453. Prostate Studies. D. I. Macht (Proc., *Amer. J. Physiol.*, 1921, **55,** 311-2).—Experiments of feeding tadpoles on prostate; the effects of prostatic extracts on contractions of genito-urinary organs or on rats in mazes are alluded to, most if not all of which matter has already been referred to in former abstracts.—W. D. H.

1454. Mikuliczscher Symptomenkomplex und innere Sekretion. E. W. Taschenberg (*Münch. med. Woch.*, 1921, **68,** 333).—A note on 17 cases suggesting a connection between Mikulicz's symptom complex (symmetrical swelling of the parotid, submaxillary, sublingual glands, etc.) and disorders of the ductless glands, in particular testicle and ovary.—J. H. B.

1455. Endocrine Glands of a Tumour-bearing Female Albino Rat. F. S. Hammett (*Endocrin.*, 1921, **5,** 216-20).—Marked alterations in weights of all the endocrine glands were observed. The hypo- or hyper-function of these several tissues serves to explain some of the abnormalities observed in the other tissues, and can be correlated in part with certain clinical observations reported on man.—W. D. H.

1456. Weitere Studien über die von einzelnen Organen hervorgebrachten Substanzen mit spezifischer Wirkung—V. E. Abderhalden and E. Gellhorn (*Pflüger's Arch.*, 1921, **187,** 243-68).—Optones (see Abstract No. 2660, Vol. V., p. 423) from corpus luteum, testis, pituitary, and thymus were examined as regards their actions on isolated heart strips and plain muscle. The results are confusing and the tracings unconvincing, except as regards the action of pituitary on plain muscle.—C. L. E.

REPRODUCTIVE SYSTEM

1457. Structure and Homologies of Free-Martin Gonads. B. H. Willier (*J. Exp. Zool.*, 1921, **33,** No. 1).—In the free-martin (a sterile female co-twin to a normal male in cattle) an indifferent gonad with a primary female determination, under the influence of sex hormones from the male twin, may develop variable degrees of transformation in the male direction. The fundamental sex organ may be rather completely inverted by means of hormones of the opposite sex. Sex differentiation, then, is not exclusively determined by the union of the gametes.—W. D. H. (*W. I.*).

1458. Testis and Ovary Grafts on the Hen's Egg and their Effects on the Embryos. T. Minoura (*J. Exp. Zool.*, 1921, **33,** No. 1).—By grafting a piece of testis or ovary of the chick on the chorio-allantoic membrane of embryos, a number of instances were secured in which the graft grew, and which developed with intersexual characters in the reproductive system. Before hatching, a normal male has testes of equal size and a Wolffian duct on either side; a normal female has 1 (left) ovary, 2 Wolffian ducts, and 2 Müllerian ducts (the left duct already showing differentiation). Intersexual characters exhibited in varied degrees by embryos affected by gonadic grafts were: coexistence of gonads of the male type with differentiated Müllerian ducts of the female type; larger gonad on the left side and smaller gonad on the right side; these are of male type, but in size show female features; persistence of the right gonad in embryos of female type. Normal embryos engrafted with other organs (liver, spleen, thyroid, thymus) do not exhibit such conditions. It is demonstrated that specific materials (sex hormones) secreted by testis and ovary stimulate development and differentiation of the homologous sex organs, and inhibit those of the opposite sex. The control of sex differentiation to some extent and the reversibility of primary sex characters have thus been experimentally accomplished in the chick embryo.—W. D. H. (*W. I.*).

1459. Properties of Gonads. III. Artificial Hermaphroditism in Rats. C. R. Moore (*J. Exp. Zool.*, 1921, **33,** No. 1).—Transplantation of a portion of a sex gland of the white rat to a rat of the opposite sex, with one of its sex glands undisturbed, was performed 20 to 50 days after birth. The transplanted gonads grew for over 8 months. A transplanted ovary grows and persists in a male possessing one testicle. Growth and differentiation of Graafian follicles proceed in a normal manner up to the period of maturation, showing that the ovary remains functional. After the period of maturation, the follicles undergo atresia and are converted into interstitial cells. Portions of a testis transplanted into a female will persist for a period of 8 months, even though one ovary is present in the female. The transplanted testis does not produce spermatozoa, for transplantation is accompanied by destruction of the germinal epithelium. The fact that ovarian grafts remain functional in a male with one normal testicle proves that there is no apparent sex-gland antagonism in the case of the white rat.—W. D. H. (*W. I.*).

1460. Parthenogenetic Frogs. J. Loeb (*J. Gen. Physiol.*, 1921, **3,** 539-45).—Adult frogs of both sexes can be produced from unfertilised eggs by puncture with a fine needle. They seemed to be normal in every respect. The number of chromosomes in the males is diploid, not haploid. To attain success, it is necessary that the operation be done on the first or second day after arrival in the laboratory. Many tadpoles did not metamorphose within a year. In one case, feeding with thyroid caused metamorphosis in 2 weeks.—W. M. B.

1461. A Volatile Sperm-stimulating Substance derived from Marine Eggs. G. H. A. Clowes and E. Bachman (Proc. Soc. Amer. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxii).—This substance is not specific, may be removed by distillation of the extract of the eggs, and is stable to alkalis, but weakened by heating with acid. It is extraordinarily susceptible to the action of oxidising agents. Similar sperm-stimulating effects are shown by a number of simple organic substances such as propyl alcohol. Probably the substance from eggs is a mixture of such products arising from autolysis. No individual component has been isolated. (See also Abstract No. 758, Vol. VI., p. 115).—J. C. D.

1462. Degenerative Changes in the Seminal Epithelium and Hyperplasia of the Interstitial Tissue in the Mammalian Testis. A. Kuntz (*Endocrin.*, 1921, **5,** 190-204).—Rabbits and dogs were unilaterally castrated, others were subjected to unilateral resection of the ductus deferens with or without ligation. Testicular degeneration followed

resection of the ductus deferens if the lumen became occluded. In several of the dogs which were subjected to this operation degenerative changes occurred also in the opposite testis. Degenerative changes occurred in the testis left *in situ* after unilateral castration in two dogs. In one dog the seminal epithelium, which had undergone degenerative changes, was restored. Degenerative changes which occur in the testis on the unoperated side probably are an expression of the physiological state of the animal. Hyperplasia of the interstitial secretory tissue is a constant accompaniment of advanced degenerative changes in the seminal epithelium. It is not a compensatory process. Dogs in which the interstitial tissue had undergone hyperplasia showed evidence of heightened sexual excitability.—W. D. H.

1463. The Sympathetic Innervation of the Vagina. J. A. Gunn and D. S. Davies (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxxvi-vii).—The reaction of the vaginal muscle to adrenaline was used as an indicator of the effect of sympathetic stimulation, and it was found to be motor, regardless of the reaction of the uterus, which is known to respond differently in different animals and in the pregnant and non-pregnant conditions. The effect was motor upon both longitudinal and circular fibres, being particularly vigorous on the rings near the vulval orifice. There is evidence that the vagina contracts during coitus. In the cat, guinea-pig, and rat, a purely sympathetic stimulation giving a vaginal contraction and a relaxation of uterus may conceivably aid the injection of spermatozoa into the uterus.—I. F.

1464. Diagnosis of Pregnancy by the Roentgen Ray. R. A. Bartholomew, B. E. Sale, and J. T. Calloway (*J. Amer. Med. Assoc.*, 1921, **76,** 912-8).—Diagnosis is never possible before the 4th month, and is rarely possible till early in the 5th month.—C. L. E.

1465. Behaviour of India Ink injected into Pregnant Animals. G. B. Wislocki (*Anat. Rec.*, 1921, **21**, No. 1).—It is recognised that inert particles in the maternal circulation are unable to traverse the placenta. The explanation has not been given except for one group of substances, the vital dyes. These, as Goldmann has shown, are absorbed and stored by the chorionic epithelium and the cells of the vitelline membrane, and thereby prevented from entering the fœtus. Carbon granules suspended in acacia (India ink) were injected into a series of pregnant guinea-pigs, rabbits, cats, and dogs. Post mortem it was observed that the granules had been deposited in the liver, spleen, lungs, and bone-marrow of the mother, and not in the placenta, fœtal membranes, or organs of the fœtus. These cells are incapable of absorbing coarse, foreign material. The limit of the size of particles which they are capable of accepting must lie somewhere between that of a coarse suspension, such as India ink, and an ultramicroscopic dispersion, such as trypan blue.—W. D. H. (*W. I.*).

1466. Über des Blutvolumen in der Schwangerschaft. A. Mahnert (*Arch. f. Gynäk.*, 1920, **114,** 168-95).—The volume of the blood increases in the second part of pregnancy. Its relative content of serum proteins diminishes, though the total quantity increases owing to the increased volume of the blood. The number of the red corpuscles is nearly the same as in the normal state.—H. W.

1467. Der Icterus neonatorum eine Folge des Abbaus mütterlichen Blutes. B. Schick (*Zeit. f. Kinderheilk.*, 1921, **27,** 233-50).—The maternal blood is destroyed in the human placenta, and the red corpuscles and their hæmoglobin absorbed by the cells of the chorionic ectoderm. It forms the source of iron for the fœtus. This maternal hæmoglobin is the mother substance of the bilirubin, which causes jaundice. The final changes into bilirubin take place in the fœtal liver. The chorionic epithelium acts like the spleen, and produces intermediate stages in bilirubin formation. Icterus neonatorum is regarded as a physiological occurrence.—H. W.

1468. Icterus neonatorum und der Eisengehalt der Placenta. R. Wagner (*Zeit. f. Kinderheilk.*, 1921, **27,** 251-61).—Bilirubin formation *in vitro* by the influence of ex-

tracts of placenta on erythrocytes or hæmoglobin could not be obtained. The liver of the fœtus is necessary for this change. By estimations of iron, destruction of the maternal blood in the placenta was proved to occur. A placenta of premature birth contains relatively more iron than in normal cases. These children show greater degrees of icterus. There is therefore a relation between the iron content of the placenta and the degree of the icterus neonatorum.—H. W.

1469. (1) Involution of Uterus. (2) Lactation and Sexual Cycle in Rat and Guinea-Pig. L. Loeb and C. Kuramitsu (*Amer. J. Physiol.*, 1921, **55,** 422-42, 442-9).—(1) Nursing (rat and guinea-pig) accelerates involution in all uterine tissues; so does castration. (2) In rats, lactation suspends ovulation. In guinea-pig it does not. In the rat the corpus luteum exerts its effect, and lasts the longer.—W. D. H.

1470. Diœstrus Changes in Opossum's Mamma. C. G. Hartman (Proc., *Amer. J. Physiol.*, 1921, **55,** 308-9).—The opossum has no placenta. The mamma overgrows in pseudo- and in real pregnancy. This occurs before ovulation, so the C. luteum is not responsible. The ovarian hormone to which it is due originates either in follicular or interstitial cells. The latter cells are stated to be absent in marsupials, but this is not so in the Virginia opossum.—W. D. H.

1471. The Rate of Ovulation in the Domestic Fowl during the Pullet Year. S. Brody (*J. Gen. Physiol.*, 1921, **3,** 431-7).—The rate of ovulation is expressed by the equation of an autocatalytic reaction. Thus it is similar to that of growth, and ovulation is an index of the growth of eggs.—W. M. B.

MILK

1472. The Concentration of Amino-Acids in the Blood in Relation to Feed and Milk Secretion. C. A. Cary (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xiii-iv).—No definite correlation of the amino-acid nitrogen of the plasma with protein of diet or milk or milk yield was established.—J. C. D.

1473. Goat's Milk: (1) Acidity; (2) Size of Fat Globules. E. W. Schultz and L. R. Chandler (*J. Biol. Chem.*, 1921, **46,** 129-31, 133-4).—(1) The average P_H is 6·53—*i.e.*, it is more acid than fresh cow's or human milk .(2) The fat is more highly dispersed than that of cow's or human milk.—J. C. D.

1474. The Titration of Organic Acids in Milk. B. Kramer and C. H. Greene (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxviii-ix).—The Van Slyke and Palmer method may be applied to milk if protein, fat, part of the lactose, phosphates, and carbonates are removed by copper sulphate and a suspension of calcium hydroxide. The method is given in full.—J. C. D.

1475. Über die Wirkung der Becquerel- und Röntgenstrahlen sowie des ultravioletten Lichtes auf die Peroxydase und Methylenblau-Formalin-Reduktase-Reaktion der Kuhmilch. H. Reinle (*Biochem. Zeit.*, 1921, **115,** 1-21).—The 2 former radiations have no influence on either enzyme, but ultraviolet light destroys both.—H. K.

1476. Über den Cholesteringehalt von Frauen und Kuhmilch. L. Wacker and K. F. Beck (*Zeit. f. Kinderheilk.*, 1921, **27,** 288-92).—The amount of cholesterol in human milk depends on the duration of lactation and also shows individual fluctuations. Average values are: Human milk, 3·29% fat, 0·1385% cholesterol; cow's milk, 365% fat, 0·1258% cholesterol. The cholesterol is in the form of cholesterol esters. Besides the cholesterol and milk fat, a further substance, soluble in alcohol and ether, and not capable of saponification, is present.—H. W.

1477. Dialysis Indicator Method for Estimation of P_H in Milk. B. Kramer and C. H. Greene (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xlii-iii).—The method

of Levy, Rowntree, and Marriott is briefly described. It was found rapid and accurate; the figures presented, compared with those obtained by the electrometric method, are very close.—W. D. H.

PHARMACOLOGY

1478. Alcoholism and White Rats. I. The Influence of Alcoholic Grandparents upon Maze Behaviour. E. C. MacDowell (*J. Exp. Zool.*, 1921, **33,** No. 1).—The grandchildren of the alcoholics, as a group, were less proficient than the controls in learning their way.—W. D. H. (*W. I.*).

1479. The Immediate Action of Volatile Substances. W. E. Dixon and F. Ransom (*J. Physiol.*, 1921, **54,** 384).—Volatile substances such as alcohol, chloroform, amyl nitrite, etc., when inhaled or injected into vessels, cause broncho-constriction and vaso-constriction respectively. This effect is a physical one, due to the passing of the substances through the cell membrane, setting up a difference on the 2 sides. When equilibrium is established, constriction ceases and gives place to the physiological effect—*e.g.*, in the case of amyl intrite, dilatation.—R. K. S. L.

1480. On Exodic Excitation and Inhibition. K. Tashiro (*Tohoku J. Exp. Med.*, 1920, **1,** 387).—Exodic excitation refers to the heightened effect which is sometimes obtained after the removal of an exciting substance; no exodic inhibition was found after adrenaline (on intestine). Straub's partition coefficient hypothesis is held to be the cause of this secondary process. [The same explanation is given by Dixon and Ransom (see preceding abstract) to account for the initial excitation of volatile substances; in the present case the effect follows the removal of the exciting substance.]—R. K. S. L.

1481. Die narkotische Wirkung des Benzins und seiner Bestandteile (Pentan, Hexan, Heptan, Octan). H. Fühner (*Biochem. Zeit.*, 1921, **115,** 235-61).—By use of a "narcosis flask" the narcotic action on mice and rats of the normal constituents of petroleum benzine—namely, pentane, hexane, heptane, and octane—was compared with ether, chloroform—and benzene. The narcotic action of the homologous series—pentane, hexane, heptane, and octane—increases in the ratio $1:3:3^2$, which also expresses the falling off of the solubility in water.—H. K.

1482. Über die pharmakologischen Elementarwirkungen in der Acridin und Acridiniumgruppe. E. Lenz (*Zeit. f. d. ges. exp. Med.*, 1921, **12,** 195-261).—Acridine is made from coal-tar, and is an analogue of anthracene, which is formed by substitution of a CH group by a N atom. Acridine derivatives possess an antiseptic action on protozoa greater than that of quinine. They are paralysing protoplasmic poisons. In higher animals the chief point of attack is the respiratory centre. They lessen blood-pressure and stop the heart. They depress the central nervous system. Differences between various derivatives are described at length.—H. W.

1483. Antiseptic Potency of Acriflavine, with Considerations on the Variability of Results in Testing Antiseptics. C. H. Browning and R. Gulbransen (*Brit. J. Exp. Pathol.*, 1921, **2,** 95-102).—W. D. H.

1484. Organ Stimulation by the Roentgen Ray. W. F. Petersen and C. C. Saelhof (*J. Amer. Med. Assoc.*, 1921, **76,** 718-20).—Experiments on dogs indicate that by local exposure the activity of organs may be augmented—*e.g.*, liver, kidney (bile and urine secretion), and pancreas (glycosuria in partial pancreatectomy reduced).—C. L. E.

1485. A Study of Mercury Injections by Means of the Roentgen Ray. H. N. Cole, S. Littmann, and T. Sollmann (*J. Amer. Med. Assoc.*, 1920, **75,** 1559-62).—The absorption of insoluble mercury preparations from intramuscular injections can be followed by the X-ray appearance. The most steady absorption is that of mercury salicylate. Metallic mercury suspensions are inefficient and dangerous.—C. L. E.

1486. Über Calcium Wirkung am vegetativen Nervensystem. W. Isener (*Zeit. f. Kinderheilk.*, 1921, **27,** 263-87).—Pilocarpine and atropine effects in children are not antagonised by Ca. Adrenaline glycosuria, which is easily produced with small doses (0·25 to 0·5 mg.) is inhibited by Ca. This is due to rise of Ca in the blood. The same is true for rabbits, and for glycosuria due to diuretin. The Ca is considered to act on nervous factors. Ca has no effect on glycosuria produced by adrenaline or in phloridzin diabetes.—H. W.

1487. Die pharmacologische Funktionsprüfung des vegetativen Nervensystems im Kindersalter. E. Friedberg (*Arch. f. Kinderheilk.*, 1921, **69,** 1-27).—Effective doses and results of pilocarpine, atropine, and adrenaline are set out in long tables for children at different ages (3 to 14). The division of the vegetative nervous system into 2 parts cannot be transferred to pharmacological effects.—H. W.

1488. On the Action of Cocaine upon the Bloodvessels of the Frog. K. Abe (*Tohoku J. Exp. Med.*, 1920, **1,** 382).—Cocaine causes dilatation in *R. temporaria* and dilatation followed by constriction in *R. esculenta*, both when perfused and applied locally.—R. K. S. L.

1489. Über Secalopan, ein neues Vollpräparat aus Secale cornutum. F. Uhlmann and V. Mirmelstein (*Zeit. f. exp. Path. u. Ther.*, 1920, **21,** 37-57).—Secalopan was found to produce more powerful effects on the musculature of the intestine, uterus, and heart than any other preparation of secale.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

1490. The Quinotoxin Myth. T. Sollmann (*J. Amer. Med. Assoc.*, 1921, **76,** 999-1001).—There is no reason to suppose toxic effects may result from conversion of quinine into "quinotoxine" (quinicine), since this is not especially toxic, and could not be formed in appreciable amount in the body.—C. L. E.

1491. Über die physiologische Wirkung einiger natürlich vorkommender Oxycumarine (Umbelliferon, Daphnetin, Aesculetin, Chrysatropasäure und Herniarin). E. Sieburg (*Biochem. Zeit.*, 1921, **113,** 176-99).—The results are described of experiments on the narcotic action on fish, the toxicity to frogs, and the influence on the isolated frog's heart and on the blood-pressure of rabbits. The lactone group had, unexpectedly, no specific action.—H. K.

1492. The Alleged Hypersusceptibility of the Rat to Squill. J. A. Gunn and R. St. A. Heathcote (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54,** lxxxv-vi).—The authors question whether the rat is more sensitive to squill than other laboratory animals. It is known that the rat is highly tolerant to other glucosides (*e.g.*, strophanthin) of the digitalis group, of which squill is a member. Experimentally it was found that the lethal dose per kilo by subcutaneous injection was 5 mg. for the rabbit and 150 mg. for the rat. The erroneous idea may be due to the fact that it is the only domestic animal that will eat squill.—I. F.

1493. Physiological Action of $\beta\beta'$-Di-iodoisopropyl, and of $\beta\gamma$-Di-iodo-n-propyl Alcohols. M. A. Mancini (*Arch. farm. sper. sci. aff.*, 1920, **30,** 161-72).—Introduced into the dorsal lymph sac of frogs, the former alcohol causes torpor and complete paralysis, while the latter produces tetanic convulsions leading to muscular relaxation and death; this is attributed to the ease with which it decomposes into allyl alcohol and iodine.—W. D. H. (*J. C. Soc.*).

1494. The Effect of Subcutaneous Injections of Solutions of Potassium Cyanide on the Catalase Content of the Blood. W. H. Welker and J. L. Bollman (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxiv).—No effect noted.—J. C. D.

1495. Über die Bedeutung von Zellzerfallsprodukten für den Ablauf pharmakologischer Reaktionen. H. Freund and R. Gottlieb (*Münch. med. Woch.*, 1921, **68,** 383-5).—An account of recent work dealing with the part played by blood and serum constituents in determining the intensity of the pharmacological action of various substances (adrena-

line, atropine, pilocarpine, etc.); these constituents are considered to be breakdown products. The platelets are regarded as of great importance in this connection.—J. H. B.

1496. Kataphoreseversuche an Kleinlebewesen. Studien über Eiweissreaktionen—III. A. v. Szent-Györgyi (*Biochem. Zeit.*, 1921, **113,** 29-35).—Cataphoretic experiments on various micro-organisms. Reference is made to its possible importance in chemotherapy.—H. K.

1497. Zur Behandlung der Rachitis mit Lebertran. W. Stoeltzner (*Münch. med. Woch.*, 1921, **68,** 272-4).—The antirachitic value of cod-liver oil is said to be increased by simultaneous administration of yellow phosphorus. The explanation is given that the value of cod-liver oil is due to the presence of certain oxyacids; these are produced more quickly from unsaturated acids in the cod-liver oil under the catalytic agency of phosphorus. The preparation of Ca salts of the oxyacids of cod-liver oil, which are said to be powerful antirachitics, is described.—J. H. B.

1498. The Effect of Phosphorus in Rickets. D. B. Phemister, E. M. Miller, and B. E. Bonar (*J. Amer. Med. Assoc.*, 1921, **76,** 850-4; see Abstract No. 2916, Vol. III., p. 505).—Phosphorus alone had the same effect as when given in conjunction with cod-liver oil, rarefied areas of the rachitic bones acquiring an approximately normal density in both instances.—C. L. E.

TOXICOLOGY

1499. Zur Oligodynamie des Silbers. R. Doerr (*Biochem Zeit.*, 1921, **113,** 58-69).—The oligodynamic action of Ag is not due to the colloidal, metal but to a soluble derivative (probably oxide). The growth of coli colonies is inhibited, whereas typhus and paratyphus are unaffected by Ag. This difference is enhanced by lactose.—H. K.

1500. Über die sogenannte oligodynamische Wirkung von Schwermetallen und Schwermetallsalzen. W. Falta and M. Richter-Quittner (*Biochem. Zeit.*, 1921, **115,** 39-41).—A variety of chemical reactions are influenced by minute traces of metals. The authors consider that the catalytic action is due to liberation of ions of the metal.—H. K.

1501. Über das Adsorptionsvermögen verschiedener Kohlensorten. Geht die von Wiechowski angegebene Probe parallel der Giftbindung? F. Horst (*Biochem. Zeit.*, 1921, **113,** 99-110).—The toxicity to mice and guinea-pigs is used as a measure of the unabsorbed substance.—H. K.

1502. Conductance of Electrolytes and their Toxicities to Fish. E. B. Powers (*Amer. J. Physiol.*, 1921, **55,** 197-200).—There is no relation between the conductivity of electrolytes and their toxicity.—W. M. B.

1503. Über die Wirkung einiger Chlorderivate des Methans, Äthans und Äthylens am isolierten Froschherzen. W. Kiessling (*Biochem. Zeit.*, 1921, **114,** 292-6).—The relative concentrations of aqueous solutions of the above substances required to stop the ventricle of the frog's heart were determined. The results are not in agreement with Traube's theory.—H. K.

1504. Der toxikologische Nachweis des Cytisins. H. Führer and E. Mertens (*Biochem. Zeit.*, 1921, **115,** 262-8).—Cytisine, the alkaloid of laburnum seeds, is characterised by pharmacological experiments on leeches and frogs.—H. K.

1505. Some Factors relating to the Toxic Action of Arsphenamine. Reid Hunt (*J. Amer. Med. Assoc.*, 1921, **76,** 854-9).—The symptoms in rats caused by *m*-amino-*p*-hydroxyphenylarsenous acid (" arsenoxide ") are very characteristic, and the presence of traces of the oxide in arsphenamine is readily detected by these. By treatment of the drug with sodium hydrosulphite the toxicity due to presence of oxide is at once diminished. The toxicity of commercial arsphenamine is not due to presence of the

oxide, since it is often greatly diminished by standing or warming; this form of toxicity is probably due to the physical state of the solution. In other cases toxicity seems to be due to inorganic As or unidentified impurities.—C. L. E.

1506. The Chemistry of Neoarsphenamine and its Toxicity. G. W. Raizin and M. Falkov (*J. Biol. Chem.*, 1921, **46**, 209-21; also Proc., xliv).—The impurities present in this drug and its analysis are considered.—J. C. D.

1507. Action of the Urease from Soy Beans. P. Carnot, P. Gérard, and (Mlle.) S. Moissonnier (*Ann. inst. Past.*, 1921, **35**, 1-42).—Urease rapidly and completely decomposes the urea of blood *in vitro*. In 48 hours blood exerts no inhibitory action on the enzyme, but in dilute solutions it shows a protective action which is independent of the inorganic salts and alkalinity of the serum, and is not due to a substance thermolabile at 65°. When urease is injected into the organism it slowly disappears from the blood-stream, and is taken up at different rates by certain organs, of which the liver appears to fix the largest amount. The urease was not recovered from the urine. Acute intoxication produced by intravenous injection of urease in the living organism causes rapid destruction of urea, and the animal dies in 2 to 3 hours with increased ammonia in the blood. Subcutaneous injection produces similar results, but more slowly. The types of intoxication produced resemble those which are obtained by the injection of salts of ammonia and weak acids. No toxic action was observed after administration of the enzyme by the mouth. No anti-urease or immunisation against this enzyme was produced, but a substance of the precipitin type was encountered.—W. D. H. (*J. C. Soc.*).

1508. Agglutination by Ricin, etc. J. A. Gunn (Proc. Physiol. Soc., 1920, *J. Physiol.*, 1921, **54**, lxxxviii-xc).—The negative charge on cholesterol particles in suspension, carmine cholesterol, and rabbit's red blood-cells is lost on ricin agglutination. A cholesterol suspension behaves towards electrolytes as a suspension of negative particles, and electrolytes enormously increase agglutination of such a suspension by ricin. Therefore ricin agglutination of red blood-cells is in part at least non-specific, and due to the precipitation of one colloid by a colloid of opposite sign. The agglutination of cholesterol by various venoms is noted, and the suggestion made that physiological activity of toxins varies with their capacity to act as positively charged colloids.—M. L. W.

1509. Venom of the Philippine Cobra (Alupong). C. Monserrat, O. Schöbl, and L. E. Guerrero (*Philippine J. Sci.*, 1920, **17**, 59-64).—This cobra secretes a venom, which may be collected from live anæsthetised animals as a thick liquid. An adult cobra yielded at one time about 0·052 g. of *dry* venom. The minimum lethal dose producing death within 24 hours after subcutaneous injection, and expressed as weight of dry venom per kg. of body-weight, was found to be 0·0002 g. for the guinea-pig, 0·0003 g. for the rabbit, 0·00008 g. for the monkey, and 0·0005 g. for the frog. It is calculated that the minimum lethal dose for man is 0·00019 g. In the animals, the venom produced twitching of the lids, ears, and muscles, salivation, vomiting, rapid respiration, and drop in temperature. Death was due to cessation of respiration. The venom produced hæmolysis of the washed erythrocytes of man, dog, rabbit, and guinea-pig, but not those of sheep, cow, and goat; it hæmolysed monkey erythrocytes with equal ease in the washed state or in the presence of the serum. The blood-sera of certain vertebrates exerted an activating action on the hæmolysin of the venom. An immune serum was obtained by subcutaneous inoculation of a horse. After immunisation for 11 months, the serum of the horse was still richer in antivenom. It may be used subcutaneously in the treatment of cobra bite.—W. D. H. (*Chem. Abstr.*).

PATHOLOGY

1510. "Intertraction" between Albuminous Substances and Saline Solutions. Sir A. E. Wright (*Proc. Roy. Soc.*, 1921, **92B**, 118-24).—It is well known that Wright's treatment of septic wounds, so much in evidence during the recent war, consists essentially of the application of hypertonic saline solutions. The idea underlying it is the existence of a tractor or drawing force ("intertraction"), which, co-operating with diffusion, draws the putrid discharge with its contained bacteria out of the wound. In the present paper this is supported by experiments, the essence of which is that if serum or similar albuminous fluid is placed on the surface of a strong salt solution (5 to 8% NaCl or similar salts), the serum, which is the lighter fluid, rapidly sinks into the heavier saline medium, and remains at the bottom. It is suggested that the serum enters into conjunction with salt, and so becomes heavier, and that the saline solution, parting with its salt, simultaneously becomes lighter; the proteins do not fall out of solution.—W. D. H.

1511. Über die Verteilung des Reststickstoffes auf Organe und Gewebe des menschlichen Körpers unter normalen und pathologischen Verhältnissen nach Untersuchungen an Leichen, zugleich ein Beitrag über die Bedeutung der Gewebe als Speicherer von abiureten Stickstoff bei Niereninsuffucienz. E. Becher (*Deutsch. Arch. f. klin. Med.*, 1921, **35,** 1-38).—Under conditions of N retention, an accumulation of abiuretic N occurs in the tissues, because the quantity retained in the blood and calculated from the increase of residual N in the blood is smaller than the total of retained N. Increased values of residual N are often found in the blood of cadavers, caused by debilitation of the organism before death, which falls specially on the kidneys. The tissues contain under normal conditions much more residual N than the blood. Tissues with œdema have a lower, protein-rich tissues a higher, content of residual N. Fatty tissue contains very small quantities, and in renal insufficiency it accumulates there less than in the other tissues. The residual N of the brain is smaller than in the other organs, and that of the pancreas is high. Moderate increase of the residual N in the tissues is found also in acute febrile diseases without renal affection. In renal disease without insufficiency, no increase of the residual N in the tissues occurs. The N retained in renal insufficiency varies in its distribution from the normal extractive N, and is distributed more equally between the blood and the tissues because of its high content of urea. No exact parallelism exists between the onset of uræmia and the quantity of the retained N. Among the tissues the muscles contain a great part of the residual N. Retention of about 200 g. urea was observed in the whole body in the most serious cases of renal insufficiency.—H. W.

1512. Vasomotor Reactions of Nasal Cavity and Post-Nasal Space to Chilling of the Body Surface. S. Mudd, A. Goldman, and S. B. Grant (Proc., *Amer. J. Physiol.*, 1921, **55,** 297 ; *J. Lab. and Clin. Med.*, 1921, **6,** 322-30).—Chilling of the surface causes reflex vaso-constriction and ischæmia in the mucous membrane of palate, tonsils and oropharynx (Abstract No. 937, Vol. V., p. 146). The same reflex occurs very readily in the nasal cavity and post-nasal space.—W. D. H.

1513. Chemische Organuntersuchungen. I. Zusammensetzung der Leber bei akuter gelber Atrophie. J. Feigl (*Biochem. Zeit.*, 1921, **115,** 22-38).—A chemical analysis of samples of liver taken from cases of acute yellow atrophy.—J. H. B.

1514. Arterio-sclerosis produced by Substances related to Adrenaline. K. Kiyono and K. Higashihara (*Kyoto Igaku Zasshi*, 1919, **15,** 154-66; *Jap. Med. Lit.*, 1920, **5,** 46).—Repeated intravenous injections of either ephedrine, or mydriatine, or adrenaline into rabbits produced characteristic lesions, chiefly in the aorta, consisting of focal

areas of necrosis of the elastic fibres and smooth muscle of the media. Adrenaline was the most toxic of the 3. Rabbits which were either old or pregnant were readily affected; those which were young or were old, but castrated, were resistant.—W. D. H. (*Chem. Abstr.*).

1515. Osteophagia in Cattle. H. H. Green (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xix).—The abnormal craving is due to phosphorus deficiency in soil and vegetation, and can be produced experimentally upon P-low rations, and removed by administering P compounds or by phosphatic manuring. Its relation to lamziekte is discussed.—J. C. D.

1516. Choleic Acid Enterolith. H. S. Raper (*Biochem. J.*, 1921, **15,** 49-52).—See Abstract No. 584, Vol. VI., p. 90, but correct erratum; food débris should be 8, not 16%.—W. D. H.

PLANT PHYSIOLOGY

GENERAL

1517. Experimentelle Studien über die Zell- und Kernteilung mit besonderer Rücksicht auf Form, Grösse und Zahl der Chromosomen. T. Sakamura (*J. Coll. Science Imp. Univ. Tokyo*, 1920, **39,** 1-221).—The author describes the effect upon cell division in various plants of treatment with ether, CO_2, warm water, Röntgen rays, etc.—C. W.

1518. Zur Physiologie der Zellteilung. G. Haberlandt (*Sitzungsber. d. preuss. Akad. Wiss.*, 1920, 323-38).—The particular cell divisions in cells of *Coleus Rehneltianus* and *Elodea densa* after plasmolysis in dilute solutions of glucose are not caused by mechanical irritation, but by the increased concentration of cellular solutions, which effect a chemical irritation.—H. W.

1519. Sur le sphérome de M. Dangeard. A. Guilliermond (*Compt. rend. soc. biol.*, 1920, **83,** 975-9, 979-82).—References to papers on mitochondria given for those interested.—W. S.

1520. Caractères differentiels de l'appareil vacuolaire et du chondriome dans la cellule végétale. A. Guilliermond (*Compt. rend. soc. biol.*, 1920, **83,** 1435-8).—The microsomes of Dangeard are apparently not oil droplets, and should not be confused with mitochondria.—W. S.

1521. Aschenbild und Pflanzenverwandtschaft. H. Molisch (*Anz. d. Akad. d. Wiss. Wien.*, 1920, 181-3).—The morphology of the mineral constituents often indicates the systematic position of the plant. Examples are given.—W. S. (*Ber. ü. d. ges. Physiol.*).

1522. Die Exkretion bei den Pflanzen. P. C. van der Wolk (*Naturw. Wochensch.*, 1920, **19,** 645-56).—Discusses the means by which toxic excretions are removed from activity in the plant.—W. S. (*Ber. ü. d. ges. Physiol.*).

1523. Höchstleistungen des Sonnenmotors (Zur Energie der Landwirtschaft). E. Reinau (*Mitt. d. deut. Landw.-Ges.*, 1920, 100-4).—A discussion of the subject.—W. S. (*Ber. ü. d. ges. Physiol.*).

1524. Influenza del nucleo pirrolico nella formazione della clorofilla—II. B. Oddo and G. Pollacci (*Gaz. chim. ital.*, 1920, **50,** [i.], 54-70).—Plants were grown in nutrient solutions containing the magnesium salt of *a*-pyrrole carbonic acid $(C_4H_4N.COO)_2Mg$. The experimental plants were *Aster sinensis*, *Euphorbia sp.*, *Solanum nigrum*, *Datura stramonium*, and *Zea mays*. In presence of the pyrrole nucleus, plants are able to form chlorophyll in absence of iron. It is suggested that the necessity for iron for the formation of green colour in plants may be due to iron acting as a catalyser in the formation of the pyrrole nucleus.—W. S.

1525. Pflanzenphysiologie. 6. Chlorophyll in Krystallen. R. Kolkwitz (*Aus der Natur*, 1920, **16**, 330-3).—To obtain crystals of crystalline chlorophyll, leaves of *Galeopsis tetrahit* are extracted with 80 to 98% alcohol for 24 hours in the dark. Some drops of the solution so obtained are placed on a glass slip, and this in a petri dish; the liquid evaporates in 6 to 12 hours. Under a magnification of 400 diameters the residue appears in the form of triangular plates (up to 28 μ) of a deep green colour, together with the rhombic microcrystals of carotene and xanthophyll. The following plants rich in chlorophyllase may also be used: *Asparagus officinalis*, acorus, dahlia, heracleum, *Stachys sylvaticus*.—W. S. (*Ber. ü. d. ges. Physiol.*).

1526. Über die chemischen Bestandteile grüner Pflanzen. II. Über das Vorkommen eines Gemisches ungesättigter Alkohole in vielen grünen Pflanzen. H. Franzen and A. Wagner (*Sitzungsber. Heidelberg. Akad. Wiss., Math.-naturw. Kl.*, Abt. A, 1920, Abh. 2, 4 pp.).—The mixture of unsaturated alcohols already found in hornbeam and sweet chestnut leaves was found in the leaves of all species (40) examined. In the distillate from mountain ash and bracken HCN was also identified, and in that from strawberry leaves citral was found. In certain plants—Wormwood, Dahlia, Peppermint—drops of ethereal oils were present.—W. S. (*Ber. ü. d. ges. Physiol.*).

1527. Studien über das Anthochlor. G. Klein (*Anz. d. Akad. Wiss. Wien.*, 1920, 183-4).—This is the name given to a yellow pigment often dissolved in the cell sap of flower cells; it was found in 60 plants out of 300 with yellow flowers examined. Anthochlor consists of a group of related pigments. Its solubility relations agree with those of the anthocyans. It is probably of glucoside nature. Three groups can be distinguished by the behaviour towards alkalis and concentrated H_2SO_4: (1) Those giving red colouration, containing quinoid grouping in the molecule (Dahlia); (2) those giving dark to orange yellow (Papaver); (3) those giving with acids green to brown, and with alkalis deep yellow crystallisation products (Verbascum). The anthochlors reduce to colourless or red flavones; with metallic salts they give yellow to red precipitates and weakly colour mordanted fibre. They are flavone derivatives with near relationships to anthocyans.—W. S. (*Ber. ü. d. ges. Physiol.*).

1528. Über den Nachweis und die Verbreitung des Chlors im Pflanzenreiche. J. Jung (*Anz. d. Akad. Wiss. Wien.*, 1920, 206-8).—For the detection of chlorine microscopically the following reagents are recommended: (*a*) Thallo-acetate 0·5 g., glycerol 2 g., distilled water 7·5 g.; (*b*) $AgNO_3$ 0·1 g., 10% ammonia 9·9 g.; when the Cl content is very small the latter reagent is modified to $AgNO_3$ 0·05 g., 10% ammonia 9·95 g. Of these reagents (*a*) is less sensitive than (*b*), but gives very characteristic crystals. By these reagents 604 species belonging to 389 genera and 137 families were tested for Cl and the results recorded.—W. S. (*Ber. ü. d. ges. Physiol.*).

1529. Zum Nachweis der Oxalate in Pflanzengeweben. W. Plahl (*Zeit. f. wiss. Mikroskop.*, 1920, **37**, 130-5).—Oxalic, tartaric, citric, and malic acids or their salts give a precipitate of the Ag salt with $AgNO_3$, but if free HNO_3 is present only oxalic acid gives a precipitate. The presence of other substances may affect the reaction, hence, when used as a microchemical test, the cell should be freed of contents other than the crystals examined. The author proposes as a microchemical reagent a 20% $AgNO_3$ solution with 15% HNO_3 (sp. gr. 1·065).—W. S. (*Ber. ü. d. ges. Physiol.*).

1530. Sur une gomme-résine de l'Euphorbia tirucalli. L. Raybaud (*Compt. rend. soc. biol.*, 1920, **83**, 1442-4).—An analysis of the gum is given.—W. S.

1531. New Source of Santonin. H. G. Greenish and Constance E. Pearson (*Pharm. J.*, 1921, **106**, 2-3).—The leaves of *Artemisia brevifolia*, a native of Kashmir and W. Thibet, yield about 1% santonin.—W. S. (*J. C. Soc.*).

1532. Über Humussäure. F. Fuchs (*Chem. Zeit.*, 1920, **44**, 551).—Humus acid was obtained by treating pure peat with alkali. It is a true dibasic acid, forming salts

with all bases. The alkali humates can be precipitated with NaCl except a small fraction, which can be precipitated with acids. The molecular weight is about 680.—W. S.

1533. Über eine neue Euglenacee. J. Gickelhorn (*Osterr. bot. Zeit.*, 1920, **69**, 193-9).—The description of this new species includes the results of a microchemical examination.—W. S. (*Ber. ü. d. ges. Physiol.*).

1534. Die Säurefestigkeit bei fettspeichernden Mikroben. P. Lindner (*Woch. Brau.*, 1920, **37**, 281-7).—Methods of differentiating in the cells of fat-secreting micro-organisms between esters, fatty acids, and neutral fats are described.—W. S. (*Abstr. Bacteriol.*).

1535. Analyses of Saltbush. F. B. Guthrie (*Agric. Gaz. N.S.W.*, 1921, **32**, 207-10).—Analyses of the saltbush (*Atriplex nummularia*) are given, and compared with those of other green fodder plants.—C. W.

1536. Über die Synthese des dl-3 : 4-Dioxyphenylalanine. K. Hirai (*Biochem. Zeit.* 1921, **114**, 67-70).—Sasaki's modification of the Erlenmeyer synthesis of amino-acids is applied to vanillin.—H. K.

1537. Studien über Phyto-Hämagglutinine. V. K. Russ and E. Oesterlin (*Biochem. Zeit.*, 1921, **114**, 258-76).—Soy beans and other leguminous plants contain agglutinating substances. They are thermo-labile, and precipitable by alcohol or ammonium sulphate.—H. K.

1538. Contribution à l'étude de l'influence des électrolytes sur le rendement en extrait soluble de la farine de maïs. Michiels et Hennes (*Bull. acad. roy. méd. de belgique*, 5ème série T.I., 26 Février, 1921, pp. 71-82).—On fait macérer de la farine de maïs pendant 6 à 9 heures dans de l'eau chloroformée à des températures de 17° à 22·5°; l'addition d'alun ferricopotassique diminue considérablement la quantité d'extrait et ceci d'autant plus que la teneur en alun est plus considérable. On observe cette même action insolubilisante pour l'alun potassique, et par ordre décroissant d'efficacité pour le sulfate de cuivre, l'alun de chrome, le bichromate de potassium et le chromate de potassium. Le sulfate de zinc n'a cette action insolubilisante qu'a des concentrations relativement élevées. Le sulfate de magnésium, le chlorure de barium ne modifient pas, aux concentrations étudiées, le rendement en extrait soluble de la farine de maïs. Le nitrate de potassium et le ferrocyanure de potassium amènent une augmentation de l'extrait sensiblement proportionnelle à la concentration du mélange en l'un ou l'autre sel. Le sulfate de nickel augmente un peu l'extrait soluble, aux concentrations faibles et moyennes, le diminue trés légèrement aux fortes concentrations. L'ion H semble favoriser le rendement en extrait soluble.—E. Z.

ENZYME ACTION

1539. Fermentstudien. V. Fermentbildung durch Ionenwirkung. W. Biedermann (*Fermentforschung*, 1920, **4**, 1-28).—The subjects dealt with in this contribution are amylopectin and amylocellulose, and the influence of salts on the autolytic disintegration of pure amylose. Salts can be arranged in a series with regard to this.—W. S.

1540. Enzymatische Untersuchungen an einigen Grunalgen. K. Sjöberg (*Fermentforsch.*, 1920, **4**, 97-141).—The influence of nutrients on the formation of enzymes was examined in *Ulothrix zonata*, *Cladophora glomerata*, *C. fracta*, and Spirogyra. The dried algæ were rubbed up with fine sand. Presence of sucrose, lactose, maltose, glucose, or galactose in the culture solution brings about a reduction in the amount of amylase, while starch, calcium tartrate, and calcium lactate bring about a slight increase in the quantity of this enzyme. Potassium chloride and potassium phosphate are without influence on the quantity of amylase, and the same is true of the action of sunlight. Treatment with 96% alcohol or with chloroform brings about an increase in the amylase, but toluene and thymol have no effect. Solutions containing sucrose, lactose, or glucose

produce an increase in sucrase; maltose and galactose bring about a slight decrease, and glycerol has no effect. Treatment with alcohol, chloroform, or toluene reduces the action of catalase, but drying the alga increases it.—W. S.

1541. Untersuchungen über den Einfluss plötzlicher Abkühlung auf gärende und abgegorene Hefe, insbesondere auf das Absetzen. H. Will (*Zeit. f. d. ges. Brauwesen*, 1920, **43,** 49, 57).—Cooling below 0° C. does not influence the settling of yeast out of the fermented wort.—W. S. (*Ber. ü. d. ges. Physiol.*).

1542. Untersuchungen über Säurewirkung und Bildung löslicher Starke bei Schimmelpilzen. Boas-Weihenstephan (*Zeit. f. d. ges. Brau.*, 1920, **43,** 114).—*Aspergillus niger*, when grown in solutions containing certain sugars, polyhydric alcohols, or organic acids, and having the correct acidity, produces soluble starch.—W. S. (*Abstr. Bacteriol.*).

1543. Naturgeschichtliche Betrachtungen über die Hefe. T. Bokorny (*Allg. Brauer- u. Hopfenzeit.*, 1920, **60,** 369, 373, 381).—Oxygen is very necessary for the multiplication of yeast. Yeasts will take possession of many organic substances which might otherwise form a nutriment for bacteria.—W. S. (*Ber. ü. d. ges. Physiol.*).

1544. Weitere Mitteilungen zur Chemie der Enzyme. T. Bokorny (*Allg. Brauer- u. Hopfenzeit.*, 1920, **60,** 705-14).—W. S. (*Ber. ü. d. ges. Physiol.*).

1545. Entgiftung von Lösungen durch Hefe und andere Mikro-organismen, Enzyme, Proteinstoffe. T. Bokorny (*Centr. f. Bakt.*, 1920, **52,** 26-39).—These organisms and substances bind inorganic and organic acids and bases, forming insoluble compounds, so that the acids and bases are removed from action in the solution.—W. S.

1546. Sur la fermentation de quelques levures des nectars des plants d'hiver. K. Schoellhorn (*Bull. soc. bot. Genève*, 1920, [2] **11,** 154-90).—A new species of yeast (*Nectaromyces cruciatus*) was isolated from the nectar of *Salvia pratensis*. From the nectar of a number of other dicotyledons 11 species of Torula were isolated. All these species were cultivated, and their properties are described.—W. S.

1547. Action du toluène sur la levure desséchée. J. Giaja and M. Djermanovitch (*Compt. rend. soc. biol.*, 1920, **83,** 1388-9).—In two cases the fermentative power of dried yeast preparations was much reduced by treatment with toluene. In one case heating the yeast in a powder for 1 hour at 70° C. prevented the action of toluene, in the other heating to 45° C. brought about a gradual lessening of the influence of toluene until after 6 hours the influence was nil. Toluene was without influence on yeast from the under part of the first preparation.—W. S.

1548. Über die Einwirkung oberflächenaktiver Nonylsäure und einiger oberflächenaktiver höherer Homologe der Alkoholreihe (Amylalkohol und Oktoalkohol) auf die Hefezelle und die Gärung. W. Windisch, W. Henneberg, and W. Dietrich (*Woch. Brau.*, 1920, **37,** 303-5).—Nonylic alcohol with increasing concentration exhibits first an accelerating, then a depressing action, and next brings about the death of a number of cells. Octyl alcohol shows analogous behaviour, but in higher concentrations. The effects are attributed to surface tension rather than to chemical action.—W. S. (*Abstr. Bacteriol.*).

1549. Ein Mikroverfahren der interferometrischen Methode zum Studium der Abwehrfermente. P. Hirsch and F. Löwe (*Fermentforsch.*, 1920, **3,** 311-7).—A description of apparatus and method.—W. S. (*Ber. ü. d. ges. Physiol.*).

1550. Wirkungsweise und Elektrolytnatur diastatischer Fermente. A. Hahn (*Sitzungsber. d. Ges. f. Morph. u. Physiol. in Münch*, 1919, **31,** 66 pp.).—The action of salts on diastatic activity in the presence of buffer mixture depends on the concentration of the buffer and of the neutral salt and on the H-ion concentration. When the latter is higher than that corresponding to the reaction optimum, the action is more rapid in the presence of a very weak buffer and neutral alkali salts than in presence of the buffer

alone in the same concentration. But slower action takes place in presence of concentrated buffer and neutral salt. Similar phenomena occur when the H-ion concentration is less than the optimum, except that with higher concentrations of buffer, although the furthering action of salt gets less, it never actually retards as when the reaction of the liquid is acid. In the presence of acetate buffer the isoelectric point lies in the neighbourhood of $P_H = 5{\cdot}5$ to $5{\cdot}7$. All salts examined displace this point towards the acid side, but there is no appreciable change in the activity of the diastase. The electrolyte theory of enzymes can therefore find no support in the case of diastase of malt and saliva.—W. S. (*Ber. ü. d. ges. Physiol.*).

1551. Über den Einfluss neutraler Alkalisalze auf diastatische Fermente—I., II. A. Hahn and K. Harpuder (*Zeit. f. Biol.*, 1920, **71**, 287-301, 302-10).—See preceding abstract.—W. S.

1552. Über spontane alkoholische Gärung in konzentrierten Zuckersäften. J. Satava (*Zeit. f. Zuckerindustrie d. tschechoslowak Republik*, 1920, **44** [N.F. **1**], 93-7).—The spontaneous fermentation of concentrated sugar solutions by 4 yeasts was examined; 3 of the races examined (races of zygosaccharomyces) are new. They fermented a 66% solution of cane sugar.—W. S. (*Ber. ü. d. ges. Physiol.*).

1553. Sur les pouvoirs liquefiant et précipitant de la papaine. E. Pozerski (*Compt. rend. soc. biol.*, 1920, **83**, 657-60).—Papain, besides its digesting and coagulating components, contains a liquefying component which is destroyed by heating to 90° to 95° C. By heating to this temperature, papain acquires a precipitating power which it did not previously possess. This power is lost when unheated papain is added to the heated substance.—W. S.

1554. Un nouvel agent destructeur des polysaccharides complexes: Pseudomonas polysaccharidarum (n. sp.). A. Epstein (*Bull. soc. bot. Genève*, 1920, [2], **11**, 191-8).—The new bacterium named in the title attacks pectin substances, cellulose, and starch, but it does not affect lignin. The properties of the new organism are described.—W. S.

1555. Über Urease, Bermerkungen zu den Arbeiten von H. Wester und P. Y. Yi in diesen Berichten. A Hahn (*Ber. deut. pharm. Ges.*, 1920, **30**, 329).—A claim of priority.—W. S.

1556. Ureasegehalt von holländischen Samen und von verschiedenen Arten Soyabohnen. H. Wester (*Pharmazeut. Zentralhalle*, 1920, **61**, 377-82).—H. W.

1557. Sur l'existance d'une lipase dans l'extrait de malt. M. H. Van Laer (*Réunion de la Soc. belge de biologie*, 26 Février, 1921, 473-4).—L'extrait de malt renferme une lipase, dont l'optimum d'action correspond à la neutralité au méthylorange. La concentration optimum en ions H est la même pour les 4 activités enzymatiques de l'extrait de malt (amylase, peptone, émulsine, lipase). Cette similitude de propriétés semble s'expliquer le mieux en supposant un granule unique support des catalyseurs effectifs.—E. Z.

1558. Über die Bildung von p-Oxyphenylessigsäure und p-Oxyphenylacrylsäure aus l-Tyrosin durch Bakterien. K. Hirai (*Biochem. Zeit.*, 1921, **114**, 71-80).—*l*-tyrosine is converted by *Proteus vulgaris* in the absence of glycerol into *p*-hydroxyphenylacetic acid, but in presence of glycerol into *p*-hydroxyphenyllactic acid; *p*-hydroxyphenylacrylic acid is an early product of degradation, and *p*-hydroxyphenylacetic acid a late one.—H. K.

1559. Über den Einfluss verschiedener Metallsalze auf die Bildung bakterieller Abbauprodukte von Aminosäuren. I. Otsuka (*Biochem. Zeit.*, 1921, **114**, 81-7).—The degradation of *l*-tyrosine to *d*-*p*-hydroxyphenyllactic acid was investigated in presence of various insoluble metallic salts. The best yields are obtained with uranyl phosphate and aluminium phosphate. The property of decarboxylation of amino-acids to the corresponding amine is rapidly lost by artificial propagation of the bacteria.—H. K.

1560. Anpassung einer Oberhefe an das Gärsubstrat Galaktose. H. v. Euler, I. Laurin, and A. Pettersson (*Biochem. Zeit.*, 1921, **114,** 277-91).—By treatment with galactose solutions a top yeast which originally fermented cane sugar 50 times as fast as galactose showed an adaptation to galactose whereby cane sugar was only fermented 6½ times as fast as galactose. The fermentation of galactose is accelerated by an extract of dried yeast, but it is undecided what constituent is responsible.—H. K.

VEGETATIVE DEVELOPMENT

1561. Über die grosse Wachstumperiode. H. Sierp (*Biol. Zent.*, 1920, **40,** 433-57).—The grand period of growth in the coleoptile of oat occurs with all light intensities, but the maximum rate of growth is earlier and lower the higher the light intensity, while the conclusion of growth is sooner reached. With increasing temperature the rate of growth increases, but the duration of growth is shorter.—W. S.

1562. Botanische Betrachtungen über entwicklungsmechanische Begriffe. E. Küster (*Naturwissenschaften*, 1920, **8,** 453-7).—Roux's work on the significance of the mechanics of development in animals can be applied to plants in some cases, but not in others.—W. S.

1563. Über die Beziehungen zwischen Stoffstauung und Neubildungsvorgangen in isolierten Blattern. S. V. Simon (*Zeit. f. Bot.*, 1920, **12,** 593-634).—When leaf-cuttings are taken of *Sinningia regina* a strong development of callus takes place, which the author connects with the presence of a large quantity of carbohydrates at the base of the leaf-stalk. If the power of growth of the basal part of the leaf is prevented by surrounding it with plaster of Paris, the formation of new tissue is prevented, but as soon as the plaster is removed new growth can proceed.—W. S.

1564. Zur Aufnahme und Verarbeitung der Nährstoffe durch die Pflanzen. Zweiter Beitrag zu einer geophysischen Pflanzenphysiologie. E Reinau (*Zeit. f. Elektrochem.*, 1920, **26,** 329-42).—It is supposed that acceptors for each element exist in the plant—*e.g.*, polypeptides for N—these acceptors being more or less powerful according to the stage of development of the plant. This hypothesis is somewhat developed.—W. S. (*Ber. ü. d. ges. Physiol.*).

1565. Ergrünungsfähigkeit von Wurzeln. A Siebert (*Beih. z. bot. Centr.*, Abt. 1, 1920, **37,** 185-216).—The roots of 58 species belonging to gymnosperms, monocotyledons, and dicotyledons were exposed to light. Of these 46 developed chlorophyll, though in 24 the green pigment was only visible microscopically. Although the cotyledons and hypocotyl of Pinus turn green in the dark, the roots of *P. montana* and *P. rigida* only turn green in the light. The roots of monocotyledons appear to turn green less readily than the roots of gymnosperms and dicotyledons. Of the species examined, the greening took place most readily in Leguminosæ. The rapidity of chlorophyll formation depends on the intensity and duration of the illumination.—W. S.

1566. L'action biologique des substances fluorescentes. S. Rebello (*Compt. rend. soc. biol.*, 1920, **83,** 884-6, 886-8).—To determine whether the action of fluorescent substances on organisms in the light is due to the production of toxic substances or to photodynamic action in which the fluorescent substance acts as a sensitiser, bulbs of *Hyacinthus orientalis* were grown in flasks containing solutions of the fluorescent substance, with the roots of the plant dipping into the solution. The experimental arrangement is described in the first paper. In the second paper the results of experiments with eosin are recorded. This was used in solutions of different concentrations varying from 0 to 800 mg. per litre. The author concludes that the action of eosin in light is not to be ascribed to the formation of toxic substances.—W. S.

1567. On the So-called Growth of Amputated Plants. A. D. Waller (Proc. Physiol. Soc., *J. Physiol.*, 1920, **54,** xix-xx).—See Abstract No. 611, this vol.—W. S.

1568. Über Eiweisskrystalloide in den Zellen von Albuca. R. F. Solla (*Österr. bot. Zeit.*, 1920, **69**, 110-23).—The protein crystalloid present in ground tissue at the beginning of organ development disappears early in the course of normal development, in epidermal cells only in older cells showing signs of senescence. Long-continued darkening and hunger influence the crystalloids little. The function of the crystalloid and its method of origin are discussed.—W. S. (*Ber. ü. d. ges. Physiol.*).

1569. Climatic Conditions in a Greenhouse as measured by Plant Growth. E. S. Johnston (*Monthly Weather Bureau, U.S. Dept. Agric.*, 1920, **48**, 215).—Buckwheat seedlings of approximately the same size and from the same stock of seed were grown for a series of 4-week exposure periods over a total time period of 13 months. Values representing the process of dry-weight production, leaf-area increase, and transpirational water loss increased during the spring and decreased during the autumn, with maxima in summer and minima in winter. The rates of stem elongation, however, showed remarkably low values for a period about the summer solstice.—C. W.

1570. Das Kalk-kali Gesetz. P. Ehrenberg (*Landwirtschaftliche Jahrbücher*, 1919, **57**, 1-159).—The "Kalk-kali Gesetz" is proved by the following experiments: When plants which receive only small quantities of K get too much Ca, the plants cannot assimilate enough K. This fact has a very harmful influence on the plants. By increasing the K content of the manure, the superfluous Ca can be thrown out, and the plant brought up to better or normal growth.—H. W.

1571. Ein Forstdüngungsversuch in einer verheideten Fichtenpflanzen. Ludwig (*Zeit. f. Forst- und Jagdwesen*, 1920, **52**, 42-51).—Some pines suffering from chlorosis on account of shortage of N, and growing on soil covered with *Calluna vulgaris*, were manured with various manures. Manuring with minerals alone neither improved the health of the trees nor suppressed the heather. An improvement of the physical conditions of the soil is necessary as well. Two methods can be adopted: (1) The soil is covered with humus-producing plant remains—*e.g.*, gorse brushwood; (2) the planting of culture plants which improve the soil—*e.g.*, *Lupinus perennis* or *Spartium scoparium*. The latter method is preferable.—W. S. (*Ber. ü. d. ges. Physiol.*).

1572. Weitere Ergebnisse der "Stickstoffdüngungsversuche mit 2- und 4- jährigen Fichten. Siefert and Helbig (*Forst. Zent.*, 1920, **42**, 258-9). **Zusammengefasste Ergebnisse der Karlsruher Stickstoffdüngungsversuche mit Fichten, ihre Bewertung und Stellen zu fremden Versuchsergebnissen.** Helbig (*ibid.*, 262-7).—Leaf colour is no sure indication of the N nutrition of pines. Sulphates are not harmful, and give good results with K and PO_4.—W. S. (*Ber. ü d. ges. Physiol.*).

GROWTH OF LOWER PLANTS

1573. Sur les formations graisseuses des Vaucheria. G. Mangenot (*Compt. rend. soc. biol.*, 1920, **83**, 982-3).—Two sorts of oil drops are found in Vaucheria; one kind, consisting of spheres of various sizes which arise in the chloroplasts, are the first visible product of assimilation; the second kind are found in the cytoplasm, are mobile and much smaller; they suggest microsomes.—W. S.

1574. Das Problem der Cyanophyzeenzelle. O. Baumgärtel (*Arch. f. Protistenk.*, 1920, **41**, 50-148).—The protoplast in the Cyanophyceæ consists of two parts, chromatoplasm and a hyaline centroplasm. The former contains a mixture of chlorophyll, phycocyan, and carotene as assimilation pigments distributed diffusely much as in many Chlorophyceæ—*e.g.*, Hydrodictyon—but it can sometimes exist as tiny granules (Meyer's granules). The centroplasm is the ground substance, in the alveoli of which separates the third component in the form of various plastids, endoplasts, epiplasts, and ectoplasts. The first form the chief part of the plastids lying in the centroplasm, and are composed

of a mixture of glucoproteins and phosphorus-containing proteins. The epiplasts arise at the periphery of the endoplasts, in which with optimal assimilation conditions carbohydrate combines with the substance of the endoplasts, and so consist of highly condensed nucleoglucoprotein in the form of a shell about a nucleus of protein character. The ectoplasts consist chiefly of protein, are formed at the periphery of the centroplasm when protein production exceeds carbohydrate assimilation. The whole centroplasm is regarded as the cell nucleus, a structure in which there is no division of work between karyoplasm and carbohydrate plastid, and which the author designates by the name karyoplast.—W. S. (*Ber. ü. d. ges. Physiol.*).

1575. Les crampons des conjuguées. E. De Wildeman (*Réunion de la soc. belge de biol.*, 29 Jan., 1921, 265-6).—A propos d'une note de M. Weatherwax (Indiana University), l'auteur fait remarquer que les crampons des conjuguées sont signalés depuis fort longtemps. Il pense que cette formation a pour but simplement de fixer ces algues à un support afin d'empêcher la dissociation des touffes et de favoriser la production des zygospores.—E. Z.

1576. Beiträge zur Kenntnis der Morphologie und Physiologie der japanischen Gloeosporien. T. Hemmi (*J. Coll. Agric. Imp. Univ. Hokkaido, Sapparo*, 1920, **9,** 1-159).—Gives details with regard to the effect of temperature, organic acids, etc., upon the growth of *Gloeosporium*. The resistance to high temperatures of the conidia of this fungus is described.—C. W.

1577. Wege zur Kultur der Morchelarten. R. Falck (*Zeit. f. Forst- u. Jagdwesen*, 1920, **52,** 312-3).—The conditions necessary for the growth of Morchella are indicated. —W. S. (*Ber. ü. d. ges. Physiol.*).

1578. Der Betriebstoffwechsel der thermophilen Pilze. K. Noack (*Jahrb. f. wiss. Bot.*, 1920, **59,** 413-66).—A number of thermophile fungi were examined, but principally *Thermoascus aurantiacus*. The thermophile fungi, which have a growth-rate higher than ordinary fungi, also have a higher rate of respiration; slower-growing thermophile fungi have normal respiration-rates. Thermoascus can rapidly adapt itself to chemically different substrata. The influence of temperature on the respiration-rate was studied. —W. S.

1579. Das Biosproblem in der Hefeforschung. P. Lindner (*Deutsche Essigind.*, 1920, **24,** 103-5).—A discussion of the question whether a single yeast cell can be made to grow on a medium consisting of water, sugar, and mineral salts only.—W. S. (*Abstr. Bacteriol.*).

1580. Über den Einfluss des Selens auf die Entwicklung einiger Schimmelpilze aus der Gattung Penicillium. A. Němec and V. Káš (*Biochem. Zeit.*, 1921, **114,** 12-22).—Sodium selenite in very minute amounts has a favourable influence on the growth of moulds—*e.g.*, *Penicillium candidum* and *P. Roqueforti*—in presence of zinc or manganese. —H. K.

1581. Influence du fer sur le pouvoir chromogène de Bacillus bruntzii, nov. sp. F. Nepveux (*Compt. rend. soc. biol.*, 1920, **83,** 742-3).—This bacillus only develops a red pigment in presence of iron in the culture medium.—W. S.

1582. On the Nature of Bacteria. H. Bergstrand (*J. Infect. Dis.*, 1920, **27,** 1-22).—The evidence is opposed to the view that fission fungi have a constancy of forms possessing morphological independence. It is thought that bacteria may be regarded as fungi imperfectly developed through reduction of higher forms.—W. S. (*Abstr. Bacteriol.*).

1583. The Production of Hydrogen Sulphide by Bacteria. J. T. Meyers (*J. Bact.*, 1920, **5,** 231-52).—H_2S is produced in large quantity by *B. typhosus* and *B. paratyphosus B*, not by *B. dysentericæ* and *B. paratyphosus A*, when peptone is used as source.—W. S.

1584. Torf als Energiequelle für stickstoffassimilierende Bakterien. E. W. Schmidt (*Cent. f. Bakt.*, II., 1920, **52,** 281-9).—Peat, after treatment with HCl and subsequent neutralisation, gives an excellent substratum for the growth of azotobacter.—W. S.

1585. The Behaviour of Bacteria in Fluid Cultures as indicated by Daily Estimates of the Numbers of Living Organisms. G. S. Graham-Smith (Memoir No. 13, Food Investigation Board; reprinted from *J. Hygiene*, 1920, **19,** 133-204).—Describes experiments undertaken with the purpose of attempting to estimate the numbers of living organisms, which are able to multiply and form colonies after subcultivation, present at different times in fluid media during prolonged cultivation under various conditions. The organism chiefly employed was a strain of *Staphylococcus aureus*.—C. W.

1586. Vitamins in Bacterial Growth. J. W. M'Leod and G. A. Wyon (*J. Path. and Bact.*, 1921, **24,** 205).—The authors were unable to convince themselves that "water-soluble B" vitamin exerts any favourable influence upon the growth of hardy bacteria—*Staphylococcus aureus*—or delicate bacteria—*e.g.*, the meningococcus—in artificial media. The growth of the pneumococcus, the meningococcus, and the hæmolytic streptococcus, is inhibited by high concentration of amino-acids.—W. E. G.

CROP YIELD

1587. Fattori biologici di rendimento agrario nel mezzogiorno—III. V. Rivera (*Riv. biol.*, 1920, **2,** 153-72).—A discussion of the factors influencing crop yield in S. Italy, and a description of some experiments with wheat seedlings showing the importance of the duration, rather than the intensity, of illumination in influencing yield.—W. S. (*Ber. ü. d. ges. Physiol.*).

1588. Kohlensäure und Pflanzenwachstum. Bornemann (*Weiner landw. Zeit.*, 1920, **70,** 270-1).—A discussion of this question.—W. S. (*Ber. ü. d. ges. Physiol.*).

1589. Das Problem der Kohlensäuredungung. H. Fischer (*Naturw. Wochensch.*, 1920, **19,** 177-84, 193-6).—CO_2 manuring increases crop yield $1\frac{1}{2}$ to 4 times, accelerates flower formation, the flowers being more numerous, larger, and more highly coloured: fruit yield is higher, and the plants are more resistant to damage. Hybrids of Tropæolum, which are little fruitful, produce seeds richly.—W. S. (*Ber. ü. d. ges. Physiol.*).

1590. Neues und neue Literatur zur Kohlensäurefrage. H. Fischer (*Angew. Bot.*, 1920, **2,** 9-15).—High yields of fennel, dwarf bean, strawberry, soya bean, *Lupinus termis*, and sugar beet were obtained by CO_2 manuring.—W. S. (*Ber. ü. d. ges. Physiol.*).

1591. Beiträge zur Frage der Magnesiadüngung. Schnitzler (*Kali*, 1920, **14,** 71-4).—Variable favourable results were obtained by manuring potatoes with potassium magnesium sulphate.—W. S. (*Ber. ü. d. ges. Physiol.*).

1592. Der Einfluss von Kalk und Magnesia auf das Wachstum der Pflanzen. T. Pfeiffer and A. Rippel (*J. f. Landw.*, 1920, **68,** 5-39).—According to the view of Loew, there should be a ratio of CaO to MgO, which gives the best yield, and with excess of either constituent above the quantity indicated by this ratio decrease in yield should result. The authors' experiments do not support this.—W. S. (*Ber. ü. d. ges. Physiol.*).

1593. Vegetations versuche mit physiologischen Reaktionen. E. A. Mitscherlich (*Landwirtschaftliche Jahrbücher*, 1919, **54,** 4 Heft, 477-91).—Various cultivated plants use the nutritive substances contained in different dungs in the same way.—H. W.

1594. The Effect of Soil Moisture Content on Certain Factors in Wheat Production. F. S. Harris and H. G. Maughan (*Utah Agric. Expt. Stat. Bull.*, **152,** 1917, 1-15).—Gives the results of 3 years' experiments on the water relations of wheat. The highest yield of grain was obtained when the soil contained about 20% moisture throughout the season. The yield of wheat was more than 20 times as great with proper moisture conditions as with unfavourable ones.—C. W.

WATER RELATIONS

1595. Tatsachen und Probleme der Moorökologie. C. Montfort (*Sitzungsber. naturhist. Ver. d. preuss. Rheinlande u. Westfalens*, 1919 [i.]; 1920, 14-20).—An investigation of the influence of the acid soil water of moorland on the intake of water. For this purpose the guttation of *Zea mays* was studied in plants growing in water culture and on the moor. The action of toxic and osmotically active substances was also studied. In some experiments a potometer was employed. Physiological drought does not appear to be present.—W. S. (*Ber. ü. d. ges. Physiol.*).

1596. Physiologische Grundlegung einer Guttationsmethode zur relativen Prüfung der Wasseraufnahme. C. Montfort (*Jahrb. f. wiss. Bot.*, 1920, **59,** 467-524).—The guttation of water from *Zea mays* is used to indicate extent of water intake by the roots. See also preceding abstract.—W. S.

1597. Maximum Values of Osmotic Concentration in Plant Tissue Fluids. J. A. Harris, R. A. Gortner, W. F. Hofmann, and A. T. Valentine (*Proc. Soc. Expt. Biol. and Med.*, 1921, **18,** 106-9).—A number of plants growing in the region of the Great Salt Lake were examined. The highest concentrations of plant tissue fluids were found in the typical salt desert half-shrub *Atriplex confertifolia*, in which the f.p. depressions in the case of 2 collections of plants made on rocky cliffs were 6·96° and 7·97°, indicating osmotic pressures of 82·9 and 94·7 atmospheres respectively; while plants growing on low ridges in salt flats gave f.p. depressions of 6·22°, 10°, and 13°, indicating pressures of 74·2, 118·5 and 153·1 atmospheres respectively.—W. S.

1598. A Study of the Structure of the Stomata of Two Species of Citrus in Relation to Citrus Canker. F. T. McLean (*Bull. Torrey Bot. Club*, 1921, **48,** 101-6).—The differences in structure between the stomata of the mandarin and those of the grape fruit are described. These differences are such as to practically exclude water from the stomata of the former, whereas it can more readily enter those of the latter. The exclusion of water is sufficient reason to account for the resistance of *Citrus* varieties to canker, since the canker bacteria are motile in water, but not when dry.—C. W.

IRRITABILITY AND MOVEMENT

1599. Die Bewegung und Reizbeantwortung der bipolar begeisselten Spirillen. P. Metzner (*Jahrb. f. wiss. Bot.*, 1920, **59,** 325-412).—The movement of *S. undula*, *S. volutans*, Rhodospirillum, and other forms is described. The rate of movement of the flagella depends on the intensity of metabolism. By altering this the movement can be reduced to nothing—*e.g.*, by photodynamically active substances. Temperature increase has the same result. Observations were also made on the reaction time and power of reaction with different stimuli.—W. S.

1600. Über die Wirkung von Licht und Kohlensäure auf die Beweglichkeit grüner und farbloser Schwarmzellen. Elizabeth Bolte (*Jahrb. f. wiss. Bot.*, 1920, **59,** 287-324).—By photokinesis is to be understood a direct action of light on movement. Swarm cells and other motile forms may be negatively or positively photokinetic, according as light or darkness brings about a cessation of movement. The following are positively photokinetic: *Chlamydomonas variabilis*, Carteria, Euglena spp., Trachelomonas, Volvocaceæ; the following negatively photokinetic: Chlamydomonas spp., Hæmatococcus, Phacus; others are indifferent: *Euglena hyalina*, *E. proxima*, Chilomonas. Connections with assimilation and chemokinesis are suggested.—W. S.

1601. Das Wesen der Lichtperzeption höherer Pflanzen. A. Heilbronn (*Sitzungsb. naturhist. Ver. d. preuss. Rheinlande u. Westfalens*, 1919 [ii.]; 1920, 15-8).—A discussion of the subject indicated in the title, coming to the conclusion that no definite conclusion can be drawn.—W. S. (*Ber. ü. d. ges. Physiol.*).

1602. Beiträge zur Kenntnis des Thermotropismus. O. Hagem (*Bergens Museums Aarbog*, 1918-19, *Naturvid. Raekke*, 1920, No. 17, 1-42).—Seedlings of various plants were used, particularly those of oat. With an old weakish solution of carbon iodosulphide and low intensity of radiation no actinotropic curvature occurred, but a positive reaction was observed with strong illumination. No such curvature was observed with a fresh 5% solution; as this allows dark heat rays to pass, it must be concluded that the infra-red rays exert no actinotropic action. With electrically heated iron plates, which give heat rays, but no luminous rays, the results were negative with an intensity of radiation of 25° to 30°, a small positive curvature occurred at 32° to 38°, a negative result at 45° to 46°, a pathological curvature at 65° to 70°. The maximum action for oat seedlings lies in violet and blue, sinks between blue and green to a very low value, which is maintained for the rest of the long waved part of the spectrum.—W. S. (*Ber. ü. d. ges. Physiol.*).

1603. Gedanken zur chemischen und physikalischen Analyse der Reizerscheinungen. V. Grafe (*Verh. d. zool.-bot. Ges. in Wien.*, 1920, **70,** 1-21).—The importance of swelling and shrinkage in stimulation is particularly emphasised and discussed.—W. S. (*Ber. ü. d. ges. Physiol.*).

1604. Untersuchungen über die Haustorienbildung bei Cuscuta. O. Gertz (*Cent. f. Bakt.*, II., 1920, **51,** 287-313).—Observations were made with *Cuscuta Gronovii* Willd. on *Impatiens parviflora* D.C. and *Solanum nigrum* as hosts. It was concluded that *Cuscuta* has no greater irritability on any particular side with regard to the production of haustoria, as a stem of *Cuscuta* between two host leaves will form a double row of haustoria. On the other hand, a development of haustoria on one side of the stem only can be induced under certain conditions—*e.g.*, if the shoot is embedded in sand.—W. S.

FLOWER AND FRUIT FORMATION

1605. Pruning. L. C. Corbett (*U.S. Dept. Agric. Farmer's Bull.*, **181**, reprint, 1920, 1-35).—Deals with the control of fruit and flower production by means of pruning. —C. W.

1606. Pollination in Escallonia macrantha. H. A. Cummins (*J. Bot.*, 1921, **59,** 111-2).—Describes the method of pollination.—C. W.

GENETIC FACTORS

1607. Der experimentelle Nachweis der Parthenogenesis in der Gruppe Aphanes der Gattung Alchemilla. G. Böös (*Bot. Notiser*, 1920, 145-50).—By castration and isolation the occurrence of parthenogenesis in *Alchemilla orbiculata* R. et P. and *A. vulcanica* Ch. et Schl. was confirmed.—W. S. (*Ber. ü. d. ges. Physiol.*).

1608. The Analysis of a Spontaneous Bean Hybrid. M. J. Sirks (*Genetica*, 1920, **2,** 97-141; in Dutch).—The behaviour on breeding of a hybrid bean with anomalous coloured seeds is recorded.—W. S. (*Ber. ü. d. ges. Physiol.*).

ENVIRONMENTAL FACTORS

1609. Die Lichtphysiologie der Pflanzen. F. J. Meyer (*Naturwiss.*, 1920, **8,** 842-51). —A review of literature.—W. S. (*Ber. ü. d. ges. Physiol.*).

1610. Intorno alla ecologia della disseminazione dell' Oxalis cernua, Thg. A. Borzi (*Riv. d. biol.*, 1920, **2,** 267-72).—This plant, a native of the Cape of Good Hope, is now abundant in the Mediterranean region, where it is propagated entirely by tubers. It is concluded that ants chiefly carry away the tubers, and so disseminate the plant, while to a less degree field mice and birds are responsible.—W. S. (*Ber. ü. d. ges. Physiol.*)

1611. Das Wachstum im Winde. O. Bernbeck (*Forstwiss. Zent.*, 1920, **42**, 27-40· 59-69, 93-100). **Wind und Pflanze.** *Ibid.* (*Tharandter forstl. Jahrb.*, 1920, **71**, 150-6). **Studien zur Lösung des Windeproblems** (in Swedish). V. Ulehla (*Bot. Not.*, 1920, 1-30).—Papers on the influence of wind on plants. Titles from *Ber. ü. d. ges. Physiol.*—W. S.

1612. Die Pflanze in ihrer Beziehung zur atmosphärischen Elektrizität. Rose Stoppel (*Zeit. f. Bot.*, 1920, **12**, 529-75).—The influence of the conductivity of the air on the respiration was examined by the use of carnotite, which increases the ionisation of the air. With increasing ionisation, the intensity of respiration of cut twigs of Æsculus increases, but of *Phaseolus multiflorus* is lessened.—W. S.

PATHOLOGY

1613. Frost and the Prevention of Damage by it. F. D. Young (*U.S. Dept. Agric. Farmer's Bull.*, 1920, **1096**).—Contains sections dealing with (1) the influence of humidity upon the rate of freezing; (2) the degree of resistance to frost damage shown by various fruits.—C. W.

1614. Über die Giftwirkung von Arsen-, Antimon- und Fluorverbindungen auf einige Kulturpflanzen. A. Wöber (*Angew. Bot.*, 1920, **2**, 161-78).—Leguminosæ are most sensitive to the action of these poisons; then follow barley, oat, wheat, maize, rye. In water cultures 0·001 g. As_2O_3 per litre of food solution is not harmful, but 0·01 g. is very harmful, so that in beans growth does not proceed, while with 0·1 g. per litre the plants are killed. Arsenic acid is somewhat less toxic, and antimony compounds and NaF considerably less so. The toxic solutions behaved similarly with regard to germination. In soil cultures arsenic acid was much more toxic than arsenious acid, antimony compounds less than the latter; KF is quite harmless, while 0·1% NaF is very toxic. In spraying the green parts of plants, arsenic acid was more toxic than arsenious acid, but the reverse was the case with the Na salts. The leaf is very little sensitive to NaF (only in 1% solution).—W. S. (*Ber. ü. d. ges. Physiol.*).

1615. Über im Jahre 1918 erschienene bemerkenswerte Mitteilungen auf dem Gebiete der tierischen und pflanzlichen Feinde der Kartoffelpflanze. L. Fulmek and A. Stift (*Cent. f. Bakt.*, II., 1920, **52**, 81-100).—Summary article.—W. S.

BOOK REVIEWS

The Extra Pharmacopœia. Vol. II. By W. H. Martindale and W. W. Westcott. Seventeenth Edition. H. K. Lewis and Co., Ltd., London, 1921. Pp. xxxii, 688. Price 17s. 6d. net.

This completes and amplifies this admirable book (see review in Vol. V., p. 269).—W. D. H.

Der Mensch als Kraftmaschine. C. Oppenheimer. Leipzig, 1921. **Verlag von Georg Thieme.** Pp. 118.

The author gives a clear account in non-technical language, and an excellent summary of the present state of knowledge concerning the changes of energy in the body, especially in striped muscles.—H. W.

Experimentelle Phonetik. G. Panconcelli-Calzia. (Sammlung Göschen, 844.) Berlin-Leipzig, 1921. **Vereinigte wissenschaftliche Verleger Walter de Gruyter u. Co.** Pp. 133.

This little book can be recommended to all who take interest in phonetic problems. It is written clearly, but the absence of pictures and curves is a disadvantage.—H. W.

H. K. LEWIS & CO., LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

1616. Physical Science and the Living Organism. A. V. Hill (*Brit. Med. J.*, 1921, i., 743-5).—A public lecture indicating the relationship of the two.—D. H. de S.

1617. Sur l'utilité des courbes de fatigue pour le control de l'entrainement en education physique. H. Dausset and Boiget (*Paris méd.*, April 16, 1921).—The authors examined numerous workers by an ergometer which tested deltoid, biceps, and hand muscles. They classify their subjects into 4 groups, mainly on the time during which the best work lasts, and consider the method of value in evaluating efficiency.—W. D. H. (*Lancet*).

1618. Sur les causes de variation de la teneur en zinc des animaux vertébrés: influence de l'âge. G. Bertrand and R. Vladesco (*Compt. rend.*, 1921, **172,** 768-70).—From analyses of various vertebrates it is believed that the amount of zinc contained in the body is maximal at or soon after birth, diminishes throughout the greater part of life and increases again in old age.—J. A. M.

1619. Changes in Catalase Content during the Life Cycle. W. E. and E. L. Burge (*Amer. J. Physiol.*, 1921, **56,** 29-32).—The variations in oxidation activity at different periods of life are attributed to the changes in catalase content.—W. D. H.

1620. Les travaux de Zwaardemaker et de ses élèves sur la radioactivité et la vie. J. Demoor (*Bull. soc. sci. méd. et nat. Bruxelles*, 1921, 12-19).—Revue critique des travaux récents de Zwaardemaker et de son école sur l'automatie du cœur, l'influence de la radioactivité pour la persistance de l'état colloïdal et le rôle du potassium radioactif dans l'organisme.—E. Z.

1621. Le mécanisme de l'hérédité. Application des lois de l'hérédité à l'étude du problème moral. L. Verlaine (*Revue de l'institut de sociologie*, **2,** 37-72, 231).—L'auteur examine successivement les causes de la vie et de l'acquisition des caractères spécifiques des organismes, le rôle du milieu externe et du milieu interne dans l'acquisition des caractères vitaux, le rôle du sarcode, la notion de l'espèce, les méthodes utilisées pour étudier la cause de l'acquisition des caractères spécifiques et pour la recherche du mécanisme de l'hérédité, l'intelligence et l'instinct chez les animaux et chez l'homme. Il s'élève contre la séparation purement artificielle établie entre le milieu interne et la milieu externe qui tous deux représentent des états d'équilibre physico-chimique et mécanique, soumis aux mêmes influences et aux même lois. Quel que soit le mécanisme de l'inscription au patrimoine héréditaire d'une espèce, d'un caractère acquis dû à l'usage, cette inscription peut se produire. Il est fort probable que les agents de la variabilité n'agissent jamais sur le germen que d'une façon indirecte, par l'intermédiaire des humeurs, toute variation étant avant tout une modification de l'équilibre organique total. Les variations sont toujours héréditaires quand la cause qui les engendrées persiste et continue à agir sur les générations successives. Elles le sont parfois quand la cause n'agit que momentanément et sur un seul organisme, mais ce phénomène est certainement rare; le vrai mécanisme de l'hérédité, c'est ce qu'on a appellé à tort la "fausse hérédité," l'influence considérable du milieu ambiant, démontré dans tous les phénomènes vitaux (apparition de la vie, variabilité, hérédité, évolution), se retrouve avec une importance plus grande encore dans le problème de l'éducation morale.—E. Z.

1622. Der Logos des Vererbungsvorgangs. V. Hensen (*Pflüger's Arch.*, 1921, **188,** 98-111).—A review, with mathematical discussion of the first Mendelian law, and comments on some features of heredity difficult of interpretation.—C. L. E.

1623. Beiträge zur Physiologie des Farbenwechsels der Fische. I. Untersuchungen an Pleuronectiden. J. G. Schaefer (*Pflüger's Arch.*, 1921, **188,** 25-48).—The change of colour of turbot or flounders is often very rapid—*e.g.*, the maximal change in *Rhombus maximus* in 3 secs. On electrical stimulation of the skin there is a lightening associated with retraction of chromatophores, and various considerations regarding the spread of this colour change, indicate that it is effected through the nervous system. If the spinal cord (and sympathetic chain) are divided at various levels, and one of the darkened skin segments is faradically excited, the blanching is now confined to that segment, whereas, on merely isolating a patch of skin by cuts, the colour change spreads generally. Curare paralyses the chromatophore reflex, and then local stimulation has merely a local effect by direct excitation. Light has no effect on the colour change. Stimulation of brain or optic thalamus is without effect, but stimulation of the medulla at once brings about general maximal blanching, while its destruction leads to immediate general darkening. There is some evidence that the spinal cord can exert an inhibitory influence. Nicotine and strychnine cause expansion, and adrenaline contraction, of the chromatophores. *Cyclopterus lumpus* behaved similarly to *Pleuronectes*, but *Raja batis* showed no response to stimuli and no adaptation to its surroundings.—C. L. E.

APPARATUS AND METHODS

1624. A New Intestinal Tube. M. Einhorn (*Amer. J. Med. Sciences*, 1921, **161,** 546-50).—The main feature of the tube, the use of which is described, is that it is made in segments, so that the length necessary can be adjusted; further, aspiration by the tube is possible.—W. D. H.

1625. Combination Mouth and Nose Piece designed for Use with Metabolic Apparatus. J. W. Moore (*J. Amer. Med. Assoc.*, 1921, **76,** 1163).—A convenient form is described. —C. L. E.

1626. Apparatus for Measuring Blood-Pressure. M. N. S. Dirken (*Ned. T. v. Geneesk.* 1920, **64,** 1539).—Description of an accurate, simple apparatus which may be carried, in the pocket.—R. B.

1627. Apparat zur zahlenmässigen Feststellung der Pupillenreaktion. Fackenheim (*Deutsch. med. Woch.*, 1921, **47,** 238).—An apparatus for measuring changes in the pupil is described and figured.—W. D. H.

1628. Über einen Apparat (Justierblock) zur subjektiven Bestimmung der Pupillardistanz und zur Festsetzung der Stellung der Gesichtslinien. A. Tschermak (*Pflüger's Arch.*, 1921, **188,** 21-4).—Description of apparatus.—C. L. E.

1629. Un appareil simple pour mesurer la tension superficielle. W. Kopaczewski (*Compt. rend.*, 1921, **172,** 723-5).—The drawbacks to Traube's apparatus are (1) that evaporation may take place from the surface of the drop, (2) that the number of drops varies with the temperature, and (3) that the graduations are arranged for distilled water and are inaccurate for other fluids. The author's apparatus is designed to overcome these difficulties.—J. A. M.

1630. Studien zur Methodik der refraktometrischen Serum-untersuchung auf Abwehrfermente (Mikro-Abderhalden-Reaktion). H. Meyer (*Biochem. Zeit.*, 1921, **114,** 194-219).—Not suitable for abstracting.—H. K.

1631. Zur Bangschen Mikroblutzuckerbestimmung. Abmessen des Blutes ohne Torsionswage. Z. Ernst and St. Weiss (*Wien. klin. Woch.*, 1921, **34,** 174-5).—Short

description of the simplified method. The differences in comparison with the results by the torsion balance of Bang are at most ± 2%.—H. W.

1632. Ein Apparat zur Aufzeichnung der Tropfenzahl und der in der Zeiteinheit einfliessenden Flüssigkeitsmenge. P. Ellinger (*Zeit. Biol.*, 1921, **73**, 116-7).—The apparatus described can register 250 c.c. fluid, and has an error of only 0·05%. With a sufficient speed of the kymograph, 100 drops per min. can be counted.—H. W.

1633. A Hydrogen Electrode Vessel adapted for Titrations. A. B. Hastings (*J. Biol. Chem.*, 1921, **46**, 463-6).—The description of this apparatus must be read in the original, with the diagrams provided.—W. D. H.

1634. Colorimetric Method for Determining the Hydrogen-Ion Concentration of Small Amounts of Fluid. L. D. Felton (*J. Biol. Chem.*, 1921, **46**, 299-305).—The colours are matched on a white plate, as in the method described by Moore and Wilson (*Biochem. J.*, 1906, **1**, 297). The difference is in the use of colorimetric comparison instead of the older titration method.—H. E. R.

1635. Vereinfachung der Indikatorenmethode. L. Michaelis (*Deutsch. med. Woch.*, 1921, **47**, 465).—Still further simplification of the indicator method for determining P_H is described, details of which specialists must consult. A modification of Walpole's comparator is figured.—W. D. H.

1636. Clinical Method for the Estimation of Potassium in Small Amounts of Serum. B. Kramer and F. F. Tisdall (*J. Biol. Chem.*, 1921, **46**, 339-49).—The potassium is precipitated by the addition of sodium cobalti-nitrite to the unaltered serum, and the precipitate titrated by means of potassium permanganate.—H. E. R.

1637. Sur l'emploi de l'acide trichloracétique et du sulphate de cuivre comme adjuvants dans la méthode de Kjeldahl. Application à l'urine. A. Grigaut and J. Thiery (*Compt. rend. soc. de biol.*, 1921, **84**, 716-8).—J. H. B.

1638. Les nouvelles méthodes de recherches biochimiques. A. Slosse (*Bull. soc. sci. méd. et nat. Bruxelles*, 1921, 36-48; *Bull. soc. chirig. le Belgique*, 1921, **30**, 97-108).—L'auteur démontre la précision et la concordance parfaites obtenues par les méthodes de Folin pour doser l'azote total, l'urée, l'ammoniaque, la créatinine, l'acide urique les purines. Il fait resortir l'excellence de la méthode de dosage de l'azote aminé de Van Slyke. Il préconise l'emploi de ces méthodes en clinique pour l'examen du sang et de l'urine.—E. Z.

1639. Propriétés physiologiques des acides nucléiques des ganglions lymphatiques et du thymus. Conditions pour obtenir un acide thymo-nucléique très actif sur le sang. Doyon (*Compt. rend.*, 1921, **172**, 820-1).—Practical chemical details.—J. A. M.

1640. A New Method of Neuron Staining for Celloidin Sections. S. T. Bok (*Proc. 18th Ned. Nat. en Gen. Congres*, date, page, etc., not given).—The silver impregnation method of Cajal and Bielschowsky are unreliable. At the reduction stage the author introduces a gum solution. The results are stated to be astonishing.—R. B.

CHEMICAL

1641. Sur la substance organique fondamentale de l'amylopectine. S. and A. Mayer (*Compt. rend.*, 1921, **172**, 1079-82).—Amylopectine is the phosphoric ether of an undetermined carbohydrate, and is obtained from starch solution by a process of electrodialysis. It forms a transparent jelly, gives a violet-brown colour with iodine, and its molecular weight is estimated at 140,000. The carbohydrate derived from amylopectine has a higher molecular weight than the other amyloses, and is a non-reducing substance. It is suggested that the changes in the reaction to iodine are not necessarily an indication of decomposition of starch, but that the blue colour given by amylose is due to a lactone

structure, while the red colour is due to the change of the lactone to a hydroxylated chain. A classification of amyloses and dextrins is proposed.—J. A. M.

1642. Dosage du maltose ou du lactose en présence d'autres sucres réducteurs (emploi de la liqueur de Barfoed). Legrand (*Compt. rend.*, 1921, **172**, 602-4).—The estimation is carried out by (1) boiling the solution containing the sugars for 3 mins. with Barfoed's solution, and finding the amount of copper reduced as in Bertrand's method, and (2) estimating the total reducing power of another sample on Fehling's solution. The first step gives the quantity of monosaccharide, and the amount of disaccharide is obtained by difference.—J. A. M.

1643. Chemistry of the Sugars—I. H. Kiliani (*Ber. deutsch. chem. Ges.*, 1921, **54B**, 456-72).—Experiments, undertaken with the immediate object of preparing free aldehyde acids of the sugar group (or their lactones), have shown that the action of nitric acid at the ordinary temperature is capable of very wide application in the series, and many examples of its use are given.—W. D. H. (*J. C. Soc.*).

1644. Polysaccharides. II. Diamylose. P. Karrer and C. Nägeli. **III. Cellulose.** P. Karrer and F. Widmer. **IV. Degradation of Potato Starch.** P. Karrer and C. Nägeli. **V. Methylation of Inulin.** P. Karrer and L. Lang. **VI. Constitution of Starch and Glycogen.** P. Karrer and C. Nägeli (*Helv. Chim. Acta*, 1921, **4**, 169, 174, 185, 249, 263).—Titles taken from *J. C. Soc.* Both starch and glycogen are polymerised diamylose, and differ in degree of polymerisation. This is not so high as formerly supposed. In dextrins the degree of polymerisation is less.—W. D. H.

1645. Polarimetric Estimation of Starch. H. Lührig (*Pharm. Zentr.-h.*, 1921, **62**, 141-4).—Ewer's method yields trustworthy results which are not influenced to any great extent by slight differences in the concentration of the acid. It is most important, however, that the time of heating (15 mins.) should not be altered, and in no case should it exceed 16 mins. A method described recently by Mannich and Lenz (*Zeit. Nahr. Genussm.*, 1920, **40**, 1), in which the starch is dissolved in hot calcium chloride solution containing a small quantity of acetic acid, also yields trustworthy results.—W. D. H. (*J. C. Soc.*).

1646. Detection of Lactic Acid. L. Hartwig and R. Saar (*Chem. Zeit.*, 1921, **45**, 322).—A bright red coloration is obtained when 0·2 c.c. of a solution containing not more than 0·2% of lactic acid is heated for 2 mins. at 100° with 2 c.c. of concentrated sulphuric acid, then cooled, and treated with 2 drops of 5% alcoholic guaiacol solution. The reaction is not given by formic, acetic, malic, benzoic, or salicylic acids; citric acid gives a yellow and tartaric acid a slight red, whilst tannin yields a blackish-violet colour.—W. D. H. (*J. C. Soc.*).

1647. Preparation of Galactonic Lactone. P. A. Levene and G. M. Meyer (*J. Biol. Chem.*, 1921, **46**, 307-8).—Described by title.—H. E. R.

1648. Reduction of Osmic Acid by Fats. J. R. Partington and D. B. Huntingford (*J. Roy. Micr. Soc.*, March, 1921, Pt. I., 15-19).—The black substance formed by the reduction of osmic acid (osmium tetroxide, OsO_4) by olein in tissue staining is a hydrated form of osmium dioxide (OsO_2), probably $OsO_2 \cdot 5H_2O$.—W. D. H.

1649. Zur Ursache der Wasseraufnahmefähigkeit tierische Fette, insbesondere des Wollfettes. I. Lifschütz (*Zeit. physiol. Chem.*, 1921, **114**, 108-26).—A survey of the author's own work, already published, leading him to the conclusion that "metacholesterol," an oxidation product of cholesterol, is the chief substance in wool-fat responsible for its power of taking up water.—H. W. D.

1650. Généralisation des reactions de Salkowski, de Liebermann et de Schiff. Galavielle, Portes, and Cristol (*Bull. de la soc. des sci. médit. biol. de Montpelier*, 1921, **2**, 129-32).—In their work on the elimination of terpenes, the authors found that the above reactions for cholesterol sometimes give the same colour with these substances, but in

other cases they are different. Schiff's reaction (dissolve in HNO_3, evaporate carefully, and add ammonia) gives a yellow with the acid and red with NH_4OH. This occurs with cholesterol and all terpenes examined, except menthol; in that case NH_4OH only deepens the yellow. The material, when simply touched with H_2SO_4, gives red with cholesterol, terpene, camphor of Borneo, sassafras and buchu, and terebinthine; yellow with Japan camphor and synthetic camphor; brown with menthol. Salkowski's reaction (dissolve in chloroform, add H_2SO_4 and shake) gives a red in the chloroform and green fluorescence in the acid with cholesterol; with terpene, the $CHCl_3$ is uncoloured and the acid is orange red; with Japan and synthetic camphor, the $CHCl_3$ shows a yellow fluorescence and the acid is golden yellow; with Borneo camphor and terebinthine, the $CHCl_3$ is yellow and the acid orange red; with sassafras camphor, the $CHCl_3$ is faint yellow and the acid cherry red; with buchu camphor the same occurs, except that the $CHCl_3$ is only fluorescent; with menthol, the $CHCl_3$ becomes cloudy and the acid orange. In Liebermann's reaction (dissolve in $CHCl_3$ and add acetic anhydride and H_2SO_4) cholesterol gives blue; terpene an evanescent yellow; Japan and synthetic camphor nil; Borneo camphor, buchu camphor, and terebinthine red brown; sassafras camphor gold; and menthol cherry red.—W. D. H.

1651. Lecithin. IV. Lecithin of the Brain. P. A. Levene and I. P. Rolf (*J. Biol. Chem.*, 1921, **46,** 353-65).—Lecithin was isolated from ox brains, and the varieties of its contained fatty acids were determined.—H. E. R.

1652. Dosages comparatifs de l'azote par les méthodes Kjeldahl et Folin. L. Hannaelt et R. Wodon (*Bull. soc. méd. et nat. Bruxelles*, 1921, 30-1).—Les auteurs constatent la parfaite constance des résultats obtenus par la méthode de Kjeldahl et la microméthode de Folin dans le dosage de l'azote total.—E. Z.

1653. Modification of the Van Slyke Method of Protein Analysis. P. Menaul (*J. Biol. Chem.*, 1921, **46,** 351-2).—Humin and ammonia are precipitated by phosphotungstic acid added directly to the protein hydrolysate.—H. E. R.

1654. Purification of Proteins. Ada M. Field (*J. Amer. Chem. Soc.*, 1921, **43,** 667-8).—Proteins possess amphoteric properties. Hence any protein with *iso*electric point at a H-ion concentration greater than that of water will lose any combined basic elements when dialysed for a sufficient length of time against dilute acid, and the resulting acid-protein compound can then be completely converted into protein by dialysis against water. Gelatin purified by this procedure forms an opaque, white jelly, free from ash. Similarly, proteins with *iso*electric points less than that of water in respect of H-ions may be successively treated with dilute alkali and water.—W. D. H. (*J. C. Soc.*).

1655. Über die Einwirkung von β-Naphtalinsulphochlorid auf Proteine. S. Edlbacher and B. Fuchs (*Zeit. physiol. Chem.*, 1921, **114,** 133-6).—β-N is allowed to react with various proteins in alkaline solution, and the amount of substitution is determined. Proteins which give widely differing figures for formol titration and N methylation show practically no difference in their sulphonation indices.—H. W. D.

1656. Die Konstitution des Glutamins. H. Thierfelder (*Zeit. physiol. Chem.*, 1921, **114,** 192-8).—There are two possible formulæ for glutamine: (1) $CO.NH_2.CH_2.CH_2.CH(NH_2).COOH$, or (2) $COOH.CH_2.CH_2.CH(NH_2).CO.NH_2$. Using T. B. Johnson's methods for the preparation of hydantoins, (1) is shown to be the correct formula.—H. W. D.

1657. Sur l'hémocyanine. C. Dhéré and A. Schneider (*Compt. rend. soc. biol.*, 1920, **83,** 1505-7; see Abstracts Nos. 767-8, Vol. V., p. 119).—The investigations were made on the blood of crayfish, crab, and cuttle-fish. As in the case of the snail and lobster, complete reduction occurs on aeration with an indifferent gas, also by exhaustion and heating. A green compound was formed with nitric oxide and snail hæmocyanin, but not with lobster hæmocyanin. In the crayfish, the compound is formed in small

quantities by long passage of the gas. Larger quantities are formed in the cuttle-fish. Preparations from snail hæmocyanin gradually assume a yellowish colour.—W. D. H.

1658. Über die Gallensäure. X. Der weitere Abbau der Desoxycholsäure. H. Wieland and W. Schulenburg (*Zeit. physiol. Chem.*, 1921, **114,** 167-91).—A study of chemical structure based on the oxidation of derivatives of the above acid.—H. W. D.

1659. Preparation and Properties of Some Salts of Uric Acid. L. J. Curtman and D. Hart (*J. Biol. Chem.*, 1921, **46,** 599-613).—The salts dealt with are those of K, Zn, Ni, and Cu. Purely chemical.—W. D. H.

1660. Production of Carbon Monoxide by Action of Alkaline Hypohalogenites on Urea. W. H. Hurtley (*Biochem. J.*, 1921, **15,** 11-18).—Krogh's work is confirmed. With a 2% solution of urea and sodium hypobromite under ordinary conditions 0·7% of the gas evolved is CO. This gas (with nitrogen) is also formed when sodium hypochlorite reacts with urea, when ammonia or caustic soda reacts with dichlorcarbamide, and when sodium hypobromite of suitable strength reacts with semicarbazide, hydrazodicarbonamide, azodicarbonamide, and acetyl carbamide.—J. A. H.

1661. Synthesis of Cyanic Acid by Oxidation of Organic Substances. R. Fosse (*Ann. inst. Pasteur*, 1920, **34,** 715-62).—Urea is a product of vegetable as well as animal cells. Plants are provided with the urease, which decomposes urea into NH_3 and CO_2, both readily used by the organism, so that N loss does not occur. Urea can be detected and measured by precipitation with xanthydrol. It is found in the products of hydrolysis and oxidation of protein, the amount formed being greater than that which would result from the arginine content of the protein. Urea is also formed during the oxidation of carbohydrates by $KMnO_4$ in ammoniacal solution, and results from similar treatment of HCHO and glycerol. It is formed also when a mixture of protein and carbohydrate is oxidised, and in considerable quantity, as much as 40 g. per litre, when blood and glucose are simultaneously oxidised with $KMnO_4$ and the product is heated with NH_4Cl. A ureagenic substance is its precursor in the oxidation of proteins, amino-acids, glycerol, formaldehyde, glucose, lævulose, sucrose, dextrin, inulin, and starch, which can be converted into urea on heating with NH_4Cl or long standing with it at ordinary temperature. This substance can be precipitated as the Ag salt and identified as HCNO by crystalline form and colour reactions, and by other reactions described at length. It is readily converted into urea on heating with NH_4OH and NH_4Cl, but not after treatment with HNO_3. Urea was produced in greatest amount in the oxidation of HCHO in ammoniacal solution. The author believes NH_3 and HCHO are much more likely precursors of urea than NH_3 and CO_2 in the organism, and suggests that its formation takes place as follows: $HCHO+NH_3+O \longrightarrow CNH$, $CNH+O \longrightarrow CONH$, $CONH+NH_3 \longrightarrow CO(NH_2)_2$.—W. D. H. (*Chem. Abstr.*).

1662. Extraction of Melanin from Skin with Dilute Alkali. W. J. Young (*Biochem. J.*, 1921, **15,** 118-22).—Melanin has been prepared from Australian black and Cingalee skins in 2 fractions, one soluble in acid, with a lower carbon percentage and a higher nitrogen and hydrogen content than the other fraction insoluble in acid. *N*/20 NaOH at boiling-point converts the former into the latter, probably owing to loss of nitrogen and hydrogen. Analyses are given.—J. A. H.

1663. Über den Chloromfarbstoff. A. Kossel and G. Giese (*Zeit. physiol. Chem.*, 1921, **114,** 127-32).—The green colour of chloroma tumours is held to be due to iron sulphide. The iron content of the tissue is fairly high. The conditions under which soluble sulphides are produced are not known, but it is pointed out that a similar green deposit of iron sulphide is formed at the boundary of the yolk of a hard-boiled egg (compare Tinkler and Soar, Abstract No. 1060, Vol. V., p. 170).—H. W. D.

1664. Sur l'amylase. Son dosage. Mécanisme de la digestion amylolytique. L. Ambard (*Bull. de la soc. de chimie biol.*, 1921, **3,** 51-65).—Amylase is adsorbed by raw

powdered starch, and liberated by a solution of 2% NaCl in a 3% boiled starch or glycogen. By this method the amylase of blood and urine can be determined with accuracy. None of the reducing substances of urine and blood are adsorbed by starch. A P_H varying from 5·0 to 8·04 has no effect on the liberation of the adsorbed amylase. —G. V. A.

1665. Über den Einfluss von Fluornatrium auf die Wirkung der Pankreasdiastase. S. Lang and H. Lang (*Biochem.Zeit.*, 1921, **114**, 165-93).—The decomposition of starch by pancreatic diastase is inhibited by NaF. Although the amount of maltose formed falls with increasing addition of NaF, the relative proportion of glucose increases. Attempts to show that this is due to an acceleration of the action of maltase were unsuccessful. Many anomalies are recorded.—H. K.

1666. Über das Vorkommen der Arginase im gesunden und kranken Organismus. B. Fuchs (*Zeit. physiol. Chem.*, 1921, **114**, 101-7).—Arginase was not found in any organ except the liver, where it occurs in the diseased as in the normal organ.—H. W. D.

PHYSIOLOGY OF INVERTEBRATES

1667. Untersuchungen an Medusen—I. J. G. Schaefer (*Pflüger's Arch.*, 1921, **188**, 49-59).—*Chrysaora* is positively thermotactic; its optimal temperature is in autumn 17° C. The umbrella rhythm of *Chrysaora*, *Rhizostoma*, and *Cyanœa* follows the van't Hoff law, with temperature coefficients between 1·8 and 3·2. Heat paralysis is seen in the first 2 species at 28° to 32° C., and cold paralysis at 4° to 6° C. Acclimatisation to heat occurs, however. After recovery from heat paralysis there is increased excitability for some time. The rhythm is unaffected by adrenaline, slowed slightly by atropine, and paralysed by nicotine, though the alleged antagonism between the last 2 drugs was confirmed. Strychnine greatly increases the frequency of the pulsations, and in larger doses abolishes co-ordination of pulsations, while large doses produce a standstill in which the medusa responds with one contraction to even the feeblest stimulus. Curare has no effect. The frequency in *Rhizostoma* and *Cyanœa* is increased by prolonged faradic stimulation, and the latter species also shows complete tetanus; the compensatory pause after an extra systole is very distinctly seen in *Rhizostoma* and *Chrysaora*.—C. L. E.

1668. Sur les modifications adaptatives de Dunaliella salina. A. Labbé (*Compt. rend.*, 1921, **172**, 1074-6).—*D. salina* is an organism which is found in salt marshes. When it is transferred by easy stages to fresh water, it loses its brown pigment and acquires chlorophyll bodies and starch. If it is then placed in salt water the chlorophyll bodies and starch gradually disappear, and it once more becomes brown. Analogous results are obtained if it is placed in solutions of gum, sugar, or calcium chloride.—J. A. M.

1669. Sur la pression osmotique d'arrêt de la division cellulaire. F. Vlès and J. Dragoiu (*Compt. rend.*, 1921, **172**, 1127-30).—Experiments on the fertilised eggs of the sea-urchin. When these have reached the diaster stage they are placed in solutions isoelectric with sea-water, but with the osmotic pressure raised to a varying degree by the addition of sucrose. The osmotic pressure of sea-water is about 25 atm. Raising the o.p. to 31 atm. has very little effect. From this point the curve of development of the egg falls steeply, and cytoplasmic division is arrested at 36 atm. pressure. Nuclear changes still progress, however, but at higher pressures they, too, are arrested. Calculations are given to show that the work done by the o.p. is a simple function of the volume of the cell.—J. A. M.

1670. L'hétérotypie dans la mitose somatique de Corethra plumicornis. A. Dehorne (*Compt. rend.*, 1921, **172**, 931-3).—The somatic chromosomes of Corethra are always

double. Somatic mitosis presents some of the characteristics of heterotypical mitosis, and, on the contrary, the first mitosis of maturation is not at all heterotypical.—J. A. M.

1671. Sur le phototropisme de Leucoma phæorrhæa. M. Manquat (*Compt. rend.*, 1921, **172,** 1123-6).—The author has repeated Loeb's experiments with the caterpillar of *Leucoma phæorræa*, and disagrees with the latter's conclusions. He finds that light has no compelling influence on the creature's movements; that when the caterpillar is not confined in a tube its movements are in various directions; and he concludes that the "memory of the species" leads it to travel towards light in the search for food.—J. A. M.

1672. Sur l'action qu'exerce l'acide sulfurique concentré sur les œufs de Bombyx mori. A. Lécaillon (*Compt. rend.*, 1921, **172,** 718-21).—A certain proportion of unfertilised eggs of the silkworm, after being placed for 1 to 2 mins. in concentrated sulphuric acid, undergo parthenogenetic changes. This treatment does not accelerate the development of fertilised eggs. It is not proved that the acid penetrates the egg. —J. A. M.

1673. The Silkworm. (1) Digestive Enzymes. (2) The Blood. S. Kawase, K. Suda, and K. Saitô (*J. Chem. Soc. Japan*, 1921, **42,** 103-17, 118-30).—(1) The work was done on the gastric juice and the stomach walls (and the glycerol extract of the latter). The proteolytic enzyme present is trypsin. The amylase acts on starch in neutral and alkaline solutions, producing maltose and achroodextrin, whilst invertase is an endoenzyme, acting in neutral and alkaline solutions. The action of lipase is weak for the higher fats. Oxidase, peroxidase, and tyrosinase were not present. (2) The blood of the larva is amphoteric to litmus paper, whilst that of the pupa is alkaline. In both fluids, D^{17} 1·029. It acquires a black tinge when set aside for a few days, but does not coagulate. It contains amino-acids (ninhydrin reaction) and proteins (principally albumin), but not reducing sugar, ammonium salts, urea, or uric acid. It also contains oxidase, tyrosinase, trypsin, diastase, and invertase.—W. D. H. (*J. C. Soc.*).

1674. La régénération des glandes génitales chez les planaires. A. Vandel (*Compt. rend.*, 1921, **172,** 1072-4).—Planaria were cut across in front of the ovaries. The cephalic ends a few months later were found to possess testes, ovaries, and copulatory organs. It is suggested that the regeneration takes place from parenchymatous cells of embryonic character.—J. A. M.

1675. Vital Staining. F. A. Potts (*Proc. Camb. Phil. Soc.*, 1920, **20,** 231-4).—Intravitam staining of *Diplogaster* (a nematode worm) by neutral red shows in the mid-gut cells, (1) brownish, highly refracting, highly resisting granules; (2) smaller secretory purple staining granules of uniform size forming a peripheral zone round the lumen of the gut. In certain individuals the gut lumen is lined with a structureless, highly refractive layer which is formed by break-down of the granules. The soft lining to the gut may be necessary for proper symbiotic relationship between nematode and bacteria therein.—J. A. H.

1676. Regeneration in the Nerve Cord of an Annelid Worm. Ada R. Hall (*J. Comp. Neurol.*, 1921, **33,** No. 2).—Experiments were performed on the nerve cord of *Helodrilus calliginosa*. First, that there is a rapid formation of cicatrix material which comes from the cells in the blood, a tissue easily brought in to fill the gap. Second, there is a definite growth of nerve fibres from the ends of the cord into the strand formed by the cicatrix. Large ganglion cells may migrate into the strand also if the cut is through a ganglion, thus restoring the tissue to its normal condition. Third, if several ganglia are removed a strand is formed, as in simple regeneration to fill the gap, and fibres and ganglion cells are replaced by outgrowth from the cut ends. After a long period—2 to 3 months—is allowed for further growth after the normal movements return, all extra cells are absorbed away, so that the worm appears perfectly normal. Although the regeneration

appears rapid, the short time in the annelid is due to short length of fibre replaced rather than to a more rapid growth.—W. D. H. (*W. I.*).

1677. La défense des animaux groupés vis-à-vis des agents nocifs. Mme. A. Drzewina and G. Bohn (*Compt. rend.*, 1921, **172,** 779-81).—The authors have previously shown that if a certain amount of colloidal silver is added to water in which Convoluta are kept, the animals die if few are present, but have greater resistance if many are present (see Abstract No. 748, Vol. VI., p. 113). This is now shown to hold for tadpoles also. Moreover, if 2 tadpoles are placed in water in which a large number have been kept, the addition of a toxic quantity of collargol is without fatal effect. It is suggested that the tadpoles excrete into the water something which antagonises the toxic effect of the collargol.—J. A. M.

1678. Sur un mode de défense naturelle contre les infections microbiennes chez les invertébrés. E. Couvreur and X. Chahovitch (*Compt. rend.*, 1921, **172,** 711-3).—The blood of the silkworm and that of the snail have a destructive action on *B. coli* and *B. pyocyaneus* similar to that observed by Paillot in the case of the caterpillar of *Agrotis segetum* on *B. melomonthæ non liquefaciens* (see Abstract No. 761, Vol. VI., p. 115).—J. A. M.

1679. Contre les infections microbiennes chez les invertébrés. E. Couvreur and X. Chahovitch (*Compt. rend.*, 1921, **172,** 1126-7).—A reply to Paillot.—J. A. M.

1680. Le pouvoir réducteur des liquides organiques et des tissus de quelques animaux marins. R. Bayeux (*Compt. rend.*, 1921, **172,** 878-80).—A comparative study of the time taken by various marine organisms to decolourise methylene blue. This varies from 3 mins. 40 secs. for the sperm of the sea-urchin to 8 hours for the eye of the cuttle-fish. Ova have low oxidative power, but the author agrees with Loeb that the activation of the ovum is accompanied by an increase of oxidation.—J. A. M.

CELLS AND TISSUES

1681. Amœboid Movement, Tissue Formation, and Consistency of Protoplasm. L. Loeb (*Amer. J. Physiol.*, 1921, **56,** 140-67).—The amount of pseudopodial production depends on the osmotic pressure of the medium (optimum at *m*/2 NaCl). The behaviour of amœbocytes of Limulus depends also on the tissue used, temperature, and time of exposure to surrounding medium. Potassium in slightly hypotonic solution causes softening of whole cell. Mixture of salts is not so good as the natural serum. Rise of temperature increases protoplasmic movement, sometimes causing broad and rounded pseudopodia. There are 2 factors which determine migration from tissues—namely, stereotropic reaction and centrifugal growth. The clot of Limulus blood is merely an agglutination of cells, and is to be taken as the type of a tissue formation as regards the factors involved, especially changes in protoplasmic consistency and in surface tension.—W. M. B.

1682. Cytoplasmic Inclusions of the Germ Cells. IX. The Origin of the Golgi Apparatus in the Middle Piece of the Ripe Sperm of Cavia and the Development of the Acrosome. J. B. Gatenby and J. H. Woodger (*Quart. J. Mic. Sci.*, 1921, **65,** 265-92).—Must be carefully studied in the original by cytologists.—W. D. H.

1683. Über die Bedeutung der Zellkernstoffe (Nucleoproteide). W. Gröbly (*Arch. f. klin. Chirurg.*, 1921, **115,** 170-260).—The nucleoproteins play an important part for the growth in every cell. A series of organs (including the endocrine glands) with high nucleoprotein content can be regarded as organs of nucleoprotein metabolism. A disturbance of nucleoprotein metabolism influences all these organs more or less. The supposition of nervous or hormonal relations between the different organs of the endo-

crine system is therefore not necessary. A pathological increase of nucleoprotein metabolism underlies the disposition to malignant growth.—H. W.

1684. Zur Frage der synthetischen Fähigkeit der menschlichen und tierischen Zelle. Können anorganische Stoffe, insonderheit Mineralsalze, assimiliert werden? W. Weitzel (*Therap. Halbmonatshefte*, 1921, **35**, 200-7).—A short discussion and summary of our present knowledge. The question is answered in the affirmative, with certain reservations.—H. W.

1685. The Reserve Energy of Growing Embryonic Tissues. M. T. Burrows (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 133-6).—The cells of young embryonic tissue contain reserve energy, and may grow in an atmosphere of pure nitrogen for a short time. The absence of oxygen, however, soon leads to their rapid disintegration. This ability of the cells to grow without oxygen is lost with development. It fails in the case of the cells of older embryos; as development proceeds, a greater amount of oxygen is needed.—D. H. de S.

1686. Life and Growth of Transplanted Tissues. L. Loeb (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 153-5).—The effects of the individuality and species differentials have been analysed in earlier papers. In this paper some of the secondary or extraneous factors are considered. The lymphocytic reaction of the host towards the transplant does not seem to be affected by age, sex, or localised infection. Infection may, however, affect other factors, and lead to a greater production of fibrous tissue. Pregnancy appears to have no constant effect on the growth of the transplant.—D. H. de S.

1687. Histological Alterations in the Subcutis after Subcutaneous Injections of Paraffin. C. v. Gelderen (*Ned. T. v. Geneesk.*, 1921, **65**, 946).—The author made the injections in the abdominal subcutis of a young dog, and examined the results from 3 days to 4 weeks afterwards. He found that the paraffin (melting-point 43° C.) is not absorbed by phagocytosis. Round the paraffin drops fatty degenerated leucocytes and fibroblasts are found. In the neighbourhood there is a slight reactive inflammation with considerable degeneration of connective tissue. Paraffin stimulates the cells of the body permanently, as is shown by the considerable growth of fibroblasts (this perhaps explains the origin of skin cancers in paraffin labourers).—R. B.

1688. Estimation of the Organic Matter of Bone. H. E. Radasch (*Anat. Rec.*, 1921, **21**, No. 2).—After incineration of pieces of femur, tibia, and fibula, the loss indicated the amount of incinerable organic substance in compact bone. At 20 to 60 years the average % found was 40·75. In the adult cat this green-weight % was found to be 38·32, while in the rabbit (two-thirds grown) the average was 38·90%. By other methods the moisture, alcohol-soluble and ether-soluble substances were removed, and the fixed organic content determined. The average amount of moisture at 20 to 60 years is 8·42%, and the ratio of fixed organic substance to the dried bone is only 34·92%. The average amount of alcohol-soluble material is 8·46%, and the ratio of the fixed organic substance to the extracted bone is 32·36%. The average amount of ether-soluble substance is 9·27%; the ratio of the fixed organic substance to the extractable bone averages 31·34%. It seems, though, that the standard weight should be that of green bone, and if this be accepted, then the organic substance averages 40·75%.—W. D. H. (*W. I.*).

1689. Über eigentümliche Knochenmarksbefunde bei Chloroleukämie. H. Eichhorst (*Deutsch. Arch. f. klin. Med.*, 1921, **135**, 129-45).—Description of degenerative changes in, and appearance of, giant cells.—H. W.

1690. Phagocytosis in Bone Marrow, etc. G. B. Wislocki (*Bull. Johns Hopkins Hosp.*, 1921, **32**, 132-4).—In dogs and cats the phagocytosis and storage of inert particulate matter (carbon granules in India ink) is confined to liver, spleen, and lung cells.

In guinea-pigs the bone marrow plays an additional but subordinate rôle; in rabbits, the material is distributed equally in the 4 situations.—W. D. H.

1691. Triple Calcium Phosphate as a Stimulant for Bone Reproduction (Healing) in Fractures. R. J. Behan (*Med. Rec.*, New York, 1921, **99**, 650-2).—Title given for those interested.—W. D. H.

MUSCLE

1692. De la variation en poids des muscles abaisseurs et releveurs de l'aile suivant l'étendue de la surface alaire chez les oiseaux. A. Magnan (*Compt. rend.*, 1921, **172**, 1077-9).—In birds the great pectoral muscle brings down the wing, the lesser pectoral raises the wing. The greater the wing surface, the less is the development of these muscles. But in birds with small wings the relative development of the lesser pectoral is greater than in those with a large wing surface. The raising of the wing is partly due to the resistance of the air, and partly the result of muscular action, and the smaller the wing the more muscular effort is required to raise it.—J. A. M.

1693. The Function of Intercostal Muscles. C. v. Gelderen (*Ned. T. v. Geneesk.*, 1921, **65**, 2272).—The main function of these muscles is to resist the extrathoracic pressure. The scaleni are the chief inspiratory muscles in quiet respiration.—R. B.

1694. Dynamometric Experiments. J. H. O. Reys (*Ned. T. v. Geneesk.*, 1921, **65**, 817).—The pressing power of the hands and the pulling power of the muscles of the back were tested in 2,000 persons. A great many persons were stronger in the left hand (25 to 30%). The relation of muscular power in men and women is 5 : 3. In relation to age the maximal power was reached at 25 to 26 years; it becomes slightly less up to 43 to 46 years, and then begins to decrease gradually.—R. B.

1695. The Influence of the Position of the Head on the Muscular Tonus of the Extremities. J. H. O. Reys (*Ned. T. v. Geneesk.*, 1920, **64**, 2883).—The influence of flexion of the cervical spine and of the position of the head in space on muscular tonus of the right index finger is demonstrated; this influence is measured by means of the author's myotonometer, which is described. When the position of the head is asymmetric, the finger in the direction of which the head is bowed or turned shows a greater flexional tonus. This tonus increases by bowing the head in a forward direction, and decreases by moving the head the opposite way.—R. B.

1696. Die Energieumwandlungen im Muskel. IV. Über die Milchsäurebildung in der zerschnittenen Muskulatur. O. Meyerhof (*Pflüger's Arch.*, 1921, **188**, 114-60).—The lactic acid was estimated by a further modification of the method formerly used. When minced muscle is suspended in a buffer solution, the lactic acid maximum developed on heat or chemical rigor is greater than for muscle which is allowed to become acid as rigor develops. If suspended in dibasic phosphate with oxygen excluded by a stream of H_2, the whole of the glycogen is ultimately converted into lactic acid. The phosphate cannot be replaced by other buffer solutions, because these extract the essential phosphate ions, and the process comes to an end. Addition of glucose, hexose-phosphoric acid, or glycogen to the phosphate solution in the early stages has no effect on the velocity of formation of lactic acid; but if added shortly before exhaustion of the transformable carbohydrate, the yield is increased up to 0·6%. Addition of HCN retards, and alcohol hastens and increases, the lactic acid formation from glycogen. As in intact muscle (Abstract No. 2859, Vol. V., p. 455), the rate of lactic acid formation in anaerobiosis is about 4 times as great as would be calculated from the deficiency of oxygen usage when compared with muscle in oxygen. Stimulation of the oxygen usage by addition of arsenite or caffeine also proportionally increases the rate of disappearance of lactic acid.

Complete restitution of lactic acid to glycogen (Abstract No. 777, Vol. VI., p. 118) does not occur as it does in intact muscle. Also in minced, as in stimulated muscle, the relations between oxygen usage and lactic acid formation are displaced, the former being increased 10 to 12 times, and the latter 20 to 30 times; in most cases the two vary together, however—*e.g.*, *m*/20 Na oxalate or extraction with water reduces both; but alcohol causes change in contrary directions, increasing acid formation and reducing oxidation. The (increased) respiration of minced muscle is really the maximal respiration of muscle under the influence of the lactic acid.—C. L. E.

1697. Extensibility of Muscle. N. B. Eddy and A. W. Downs (*Amer. J. Physiol.*, 1921, **56,** 182-95).—A frog's gastrocnemius which has been stretched from 30 mins. to 3 hours by a weight is more easily fatigued than an unstretched muscle. The muscle must be using some of its energy in combating the stretching force, for there is increase in its CO_2 production during the stretching period. [No doubt every elementary student has noticed the early onset of fatigue if he maltreats his preparation. A statement occurs in the paper which cannot pass unnoticed—viz., "the curve of extensibility is a hyperbola (Weber), and Weber's findings have been confirmed beyond question." The authors mention Brodie's paper; let them read it.]—W. D. H.

1698. Modifications apportées au rythme de l'imbibition du tissu musculaire et de la peau par l'adjonction de lipoïdes à des solutions stanneuses. H. Drouin (*Compt. rend.*, 1921, **172,** 721-3).—Tissues immersed in stannous solutions showed rapid imbibition. If a solution containing lipoid in addition to the tin salt was used, the imbibition was slow and less in degree.—J. A. M.

1699. Action de la nicotine sur l'excitabilité et l'imbibition du muscle strié. M. Lapicque (*Compt. rend. soc. biol.*, 1921, **84,** 654-6).—The author has investigated the chronaxie of frog's gastrocnemii when these are immersed in solutions of nicotine. In response to direct stimulation, in weak solutions of nicotine (which cause slow and prolonged contraction of the muscle), the chronaxie is diminished. Direct stimulation in stronger solution, however, demonstrates an initial diminution followed by a great increase in the chronaxie. This observation explains the phenomena observed with curare and nicotine. Curare increases the chronaxie; hence in the early stage of the action of nicotine, curare and nicotine are antagonistic. Later they augment one another.—J. H. B.

1700. La chronaxie des nerfs et muscles chez les rachitiques. G. Bourguignon and G. Banu (*Compt. rend. soc. biol.*, 1921, **84,** 785-7).—The chronaxie of limb muscles in children with marked evidence of rickets is increased from 2 to 9 times the normal value. —J. H. B.

1701. Fatigue in Frog Muscle when immersed in Various Concentrations of Lipoid Solvents, especially the Higher Alcohols. F. M. Baldwin (*Amer. J. Physiol.*, 1921, **56,** 127-39).—Strong concentrations produce immediate contracture. Certain weak solutions give an initial relaxation phase followed by a reversible contracture. Details are given as to rate of penetration, and the conclusion is drawn that there is an intimate relation between the state of the plasma membrane and the physiological condition of the cell.—W. M. B.

1702. Activation of Muscle Catalase by Liver. T. C. Burnett (*Amer. J. Physiol.*, 1921, **56,** 16-21; compare Abstract No. 1731, Vol. III., p. 312).—The theory of a liver hormone is now abandoned; one of the factors of the acceleration is a change in P_H of the H_2O_2 brought about by the action of proteins, and possibly of salts also. Whether this is a "buffer" action or an adsorption phenomenon is left open.—W. D. H.

1703. Über eine aussergewöhnlich lange Zuckungskurve eines quergestreiften Muskels. C. L. Sheng and E. Schilf (*Zeit. Biol.*, 1921, **73,** 117-22).—The investigations were made on the muscle of the stomach of crayfishes; these fibres are cross-striated,

Their latent period is short (0·1 sec.), but the rise of the muscle curve lasts 6 to 8 secs., and the fall 5 to 7 mins. The relation between the latent period and the duration of the whole contraction is 1 : 100 in plain muscles (frog), 1 : 10 in the skeletal muscles, and 1 : 3,600 in the muscles now studied.—H. W.

1704. The Energy involved in the Electric Change in Muscle and Nerve. A. V. Hill (*Proc. Roy. Soc.*, 1921, **92B,** 178-84).—An expression is given for the heating effect in a muscle or nerve of the currents produced by the electric response accompanying the propagated impulse. In a muscle the heat produced is not more than 100,000th part of the energy liberated in a twitch; in a nerve it is of the order of size of $3{\cdot}5 \times 10^{-10}$ calorie or 0·015 erg. per gm. It is concluded from the smallness of these quantities that no appreciable provision of energy is required in the propagation of the electric response, and that the physico-chemical change producing the response is the only factor involved in the propagated nervous impulse.—W. D. H.

NERVE. REFLEX ACTION

1705. Algunas observaciones contrarias a la hipótesis syncytial de la regeneración nerviosa y neurogenesis normal. S. Ramon Cajal (*Trabajos d. Laborat. d. Investigaciones Biol. d. l. Univ. d. Madrid*, 1921, **18,** 275-302).—The distinguished author describes and figures the new outgrowing axis-cylinder processes (neurites) as pushing their way in the first phase of regeneration, so also in the early stage of ontogenetic development, freely and naked among the mesoblastic tissue elements (fibroblasts) and exudation. Only later do the bundles of them become ensheathed by specialised mesoblastic cells (sheath of Henle), and the individual axis cylinders by the cells forming a syncytial sheath. He urges on various grounds the doubtfulness of the sheath of Schwann cells being homologous with neuroglia. For the cells which apply themselves as a syncytial sheath to the outgrowing regenerating axis cylinders he proposes the term *coleocytes*, and considers that their origin from the cells of the sheath of Schwann, although not improbable, is unproven. His observations have, like those of Tello, quite failed to support the theory of Nageotte that every nerve fibre throughout its course to its ending is separated from mesoblastic tissue by environing cells of ectodermal origin. This ectodermal syncytium, forming a frontier between neurons and the mesoblastic tissue through which they pass, he considers incompatible with a number of histological observations. The author announces that a new edition of his well-known " Degeneracion y regeneracion de los nervions " is about to appear, containing the results of his 6 further years of work on the subject. It is to be hoped that an English translation will be arranged for.—C. S. S.

1706. Ventral Spinal Nerves in Amphioxus. H. Ayers (*J. Comp. Neurol.*, 1921, **33,** No. 2).—The dorsal spinal nerves give off branches which enter the intermyotomic spaces, and send fine nerves into the body of the myotomes, probably sensory in nature. The resemblance of the ventral nerves to the motor nerves of higher forms is pointed out.—W. D. H. (*W. I.*).

1707. Variación de la resistencia eléctrica del nervio en la excitación. V. Tedeschi (*La Prensa Méd. Argentina*, 1921, **7,** No. 30).—L'excitation faradique du nerf produit une augmentation de résistance au courant galvanique, non aux courants de haute fréquence. La diminution de résistance n'est généralement pas réversible et s'observe dans les nerfs anesthésies.—B. A. H.

1708. Les modifications chimiques du nerf vague pendant la digestion. M. Loeper, R. Debray, and J. Tonnet (*Compt. rend. soc. biol.*, 1921, **84,** 819-20).—The left vagus nerve in dogs alone amongst nerves has a varying NaCl content. It is greater during a meal.—J. H. B.

1709. A propos de la curarisation de Leptodactylus ocellatus. B. A. Houssay (*J. de physiol. et de pathol. gén.*, 1921, **19,** 66-8).—This frog can be curarised and allowed to recover. Its nerve-muscle preparation shows the 3 excitable constituents of Keith Lucas.—W. M. B.

1710. Études sur la curarisation de Leptodactylus ocellatus—IV., V., VI. J. Gugliel-metti and G. Pacella (*J. de physiol. et de pathol. gén.*, 1921, **19,** 69-79).—The activity of various preparations of curare differs markedly. This frog is one-sixth as sensitive to the same preparation as *Bufo marinus* is. With a good preparation there is no difficulty in obtaining a typical effect, from which the animal may recover if proper care is taken. The sartorius muscle, with its nerve, shows the 3 excitable substances of Keith Lucas.—W. M. B.

1711. De la dualité de la réponse musculaire dans les réflexes musculo-tendineux. H. Piéron (*J. de physiol. et de pathol. gén.*, 1921, **19,** 36-65).—An interesting discussion of the nature of the reflexes in question, based on myograms of normal and pathological subjects. These reflexes are essentially responses in opposition to the sudden elongation or stretching of a muscle. They consist of two elements: a clonic one, from the cells of the anterior horn; and a tonic one, from the anterior part of the lateral horn. Inhibition of antagonistic muscles is also present. The reflex activity of the anterior horn, or that of the lateral horn, can be modified independently of one another. —W. M. B.

1712. Le réflexe pilomoteur. André-Thomas (*Rev. neurol.*, 1920, **27,** 1139).—In the normal subject unilateral or bilateral stimuli, such as cold, friction, and electric current, cause reflex excitation of the pilomotor muscles, which may be local or may spread to the stimulated half of the body. Certain areas are particularly sensitive. Flexor surfaces of the limbs give the response less readily than the extensors. In lesions of the cord the response is exaggerated immediately below the upper level of the lesion. In total division of the cord there are 2 forms of response: the "réflexe encéphalique" above, and the "réflexe spinale" below the lesion. The latter occurs after the cord emerges from spinal shock. It is elicited by the same stimuli as the mass reflex. In partial lesions and in disease the response varies, and is difficult to interpret. The cerebral reflex varies greatly in facility and distribution. It descends to the level of the sympathetic distribution of the isolated portion of the cord. The reflex may be elicited by peripheral and by emotional stimuli. The reflex of emotional origin is bilateral, that due to peripheral stimulation may be unilateral. The pilomotor reflex may therefore be regarded as an affective reflex.—J. A. H. (*Med. Sci.*).

1713. L'irritabilité aneurale de l'ectoderme décelée par le déplacement ciliaire de l'embryon chez Rana temporaria. P. Wintrebert (*Compt. rend.*, 1921, **172,** 934-6).—Previous work has shown that muscular reflexes can be elicited in amphibian embryos by pinching the skin, before the cutaneous nerves are developed. Experiments are now recorded which show that pricking the ectoderm in early frog embryos excites or accelerates the movements of the ectodermic cilia which bring about progression.—J. A. M.

1714. Visceral Sensory Nervous System. VII. Skeletal Reflexes induced by Stimulation of Visceral Afferent Nerves in Frog and Turtle. A. J. Carlson and A. B. Luckhardt (*Amer. J. Physiol.*, 1921, **55,** 366-84).—Stimulation of lungs, heart, gall-bladder, urinary bladder, or entire gastro-intestinal tract causes reflexes to skeletal muscles, both in decerebrate and spinal animals. They are entirely of the defensive type. In the frog, ether abolishes these before complete suppression of the purely skeletal reflexes. Strychnine does not alter the threshold, but augments the effects and increases fatiguability. In the absence of skeletal effects it is possible to induce this fatigue by subminimal stimuli. In the turtle, the reflexes are decreased or inhibited by the brain.—W. M. B.

1715. Paradoxical Pupil Dilatation following Lesions of the Afferent Paths. J. Byrne (*Amer. J. Physiol.*, 1921, **56**, 113-26).—Paradoxical pupil dilatation by adrenaline can be obtained after section or injury of the contralateral sciatic nerve. This is dependent on suspension of function of the proximal sensory neurons, which in the normal state conduct impulses which cause reflex stimulation of the cervical sympathetic. The paradoxical effects are identical with those observed after removal of the superior cervical ganglion.—W. M. B.

CENTRAL NERVOUS SYSTEM

1716. Contributions of the War to the Physiology of the Nervous System. G. Horrax (*Physiol. Reviews*, 1921, **1**, 269-94).—A review on a wide subject, with only 45 references. The following subjects are dealt with: (1) *Cerebrum*, localisation, aphasia, visual area; (2) *Cerebellum*, 2 pages, ataxia and localisation; (3) *Cord*, in relation to bladder, and mass reflexes (Head and Riddoch figure largely here); (4) *Peripheral nerves*, regeneration; (5) *Sympathetic*, mainly on causalgia.—W. D. H.

1717. Changes of Nerve Cells under the Influence of Electric Currents. Y. Izawa (*J. Okayama Med. Assoc.*, Japan, 1920, No. 364, reprint, 6 pp.).—The passage of a continuous current (150 volts for an hour) through the ganglion nodosum of the rabbit results in marked chromatolysis, while alternating currents of 100 volts for the same period produce little or no change in the Nissl's granules. If the ganglion is treated with a 5·5% dextrose solution, however, a continuous current fails to evoke chromatolysis, but produces vacuolation.—R. K. S. L.

1718. The Nucleus in the Human Restiform Body. K. Hirose (*J. Okayama Med. Assoc.*, Japan, April, 1920, No. 363, reprint, 10 pp.).—A small nucleus (0·5 to 1·3 mm. long axis) occurs in the human restiform body about the level of the inferior olive, which it resembles in structure.—R. K. S. L.

1719. Über die bulbospinale Bahn. K. Hirose (*J. Okayama Med. Assoc.*, Japan, 1918, No. 347, reprint, 11 pp.).—Fibres arise from the "grauen Substanz" (substantia Rolandi?) of the medulla oblongata, and mainly cross to the opposite side to descend with the longitudinal bundles into the cord. They form a tract which serves to connect the fasciculus solitarius with the nuclei of the respiratory nerves; the author was unable to follow it to its termination, but arrives at the above conclusion an account of the respiratory disturbance resulting from the experimental lesion.—R. K. S. L.

1720. Release of Function in the Nervous System. H. Head (*Proc. Roy. Soc.*, Croonian Lecture, 1921, **92B**, 184-209).—Hughlings Jackson's law states that destructive lesions do not cause positive effects, but induce a negative condition, which permits positive symptoms to appear. Higher control lower centres. Structural lesions may remove this dominance, and so reveal the activity of subordinate centres; this is "disintegration" of function. Should the stimulus become abnormally intense, or central resistance be weakened, forms of reaction may break through which are normally suppressed; this is "escape from control." The author then considered Sherrington's experimental proof of Jackson's law, decerebrate rigidity, the condition of the lower end of the spinal cord in man after division or abolition of conduction, and the "mass reflex." Vivid response after division of peripheral nerves is not "hyperæsthesia," for the threshold may be high. It is due to uncontrolled reaction of the spot system. The following headings indicate the lecturer's points: Characteristics of protopathic sensibility; extent of stimulus of greater importance than its intensity; a warning mechanism; sensation diffuse and referred to remote parts. Excessive reaction both to pleasure and pain. Confined to parts which respond to pricking, heat, and cold, but not to lighter contacts. Integration of afferent impulses and of reflex activities in the central

nervous system. Many afferent impulses never reach consciousness, but carry out co-ordination, etc., on reflex levels. Simplest sensory act, the product of prolonged integration and of a struggle for physiological dominance. Many impulses capable of arousing sensation are not permitted to reach the highest centres. Visceral insensibility is a phenomenon of synaptic resistance rather than of absence of afferent impulses. Double supply of viscera: (1) Deep sensibility, responding to movement and pressure, but not to pricking, heat, and cold; pain produced by excessive pressure or abnormal movement; (2) protopathic, responding to pain, and in some organs, such as bladder and œsophagus, to heat and cold. Referred pain. Spreads widely, owing to intensity of stimulus, its duration, or to lowered central resistance (menstruation, fever, anæmia, psychical states). Similar escape from control of impulses from other sense organs which have been dominated in the acquisition of some new aptitude. Rotatory stimuli; adaptation and breakdown of control in central nervous system during aviation.—W. D. H.

SPECIAL SENSES

1721. Lässt sich das retinale Sehen rein physikalisch erklären? L. Koeppe (*Münch. med. Woch.*, 1921, **68,** 475-9).—The author disbelieves that photochemical changes can be at the basis of vision. He thinks they must necessarily be too slow. He puts forward an interesting physical theory of "sight resonators" situated in the terminal portions of the rods and cones. The cones, which alone are responsible for colour vision, have a tapering termination. This termination is considered to be a series of discs of diminishing thickness, each of which in some way corresponds to light of a particular wave length. On these lines the author conceives a mechanism analogous to the organ of Corti in the ear.—J. H. B.

1722. Über Wettsteit und Schwankungen im Sehfelde. C. O. Roelofs (*Arch. f. Ophthal.*, 1921, **104,** 133-48).—Fluctuations of attention are observed in the perception of contrasts and excitations which are over the limiting values. The frequency of these fluctuations is relatively constant in different cases, and shows little differences between the right and the left half of the range of vision.—H. W.

1723. Why we Accommodate. C. Loeb (*Amer. J. Ophthal.*, 1921, Ser. 3, **4,** 265-9).—A hypothesis is set out regarding the method in which light on the retina provokes the muscular action necessary to focus it, the main idea in which that the obliquity of the rays reaching or passing through the retina is an important factor.—W. D. H.

1724. The Resonance Theory of Hearing. H. Hartridge (*Nature*, 1921, **107,** 204), W. Perrett (*ibid.*, p. 301).—Arguments for and against (see Abstract No. 1238, Vol. VI., p. 184).—C. L. E.

1725. Migration of the Ear Vesicle in the Tadpole. G. L. Streeter (*Anat. Rec,*. 1921, **21,** No. 2).—In development the ear vesicle of the tadpole moves from the point of its detachment from the skin, so that it eventually lies close against the side of the hind-brain. This is not simply the result of mechanical processes of the adjacent structures, but is due in part to an autostatic tendency inherent in the vesicle itself, by which it adjusts its position during development with reference to the brain.—W. D. H. (*W. I.*)

1726. Chemical Constitution and Taste of Aldehydes, Ketones, etc. S. Furukawa (*J. Tokyo Chem. Soc.*, 1920, **41,** 706-28, 979-80).—All the experiments were conducted with the nose shut. The results are: (1) Aldehyde and ketones. Anisaldehyde, cinnamaldehyde, heliotropin, salicylaldehyde, *p*-hydroxybenzaldehyde, peryllaldehyde, and furfural have a sweet taste. Benzaldehyde (?), vanillin, citral, citronellal, acetaldehyde, formaldehyde, gingerone, menthone, camphor, ionone, methylheptenone, and acetone have not. There is no relationship between arrangement of chain, open or closed, and

taste-producing property, although in perfumery the sweet-tasting aldehyde has invariably a cyclic chain, and no ketone has yet been discovered which has a sweet taste. (2) Semicarbazones have less sweet taste than the aldehydes and ketones. (3) Phenylhydrazones do not have a sweet taste. (4) Oximes. Presence of HC : NOH in a 6-C cyclic ring eliminates the taste. There is no definite correlation between *a*-oximes and taste. Hydrochlorides of oximes are indifferent. Nitriles of the oximes have a tendency usually to produce a sweeter taste than oximes, but not always. Acetonitriles, amino-oxime, azoxime, and introduction of acid and amide groups, do not affect the sweet taste. (5) Isomers. In perfumes having open chains, the sweet taste is common to all isomers, but not in cyclic compounds. Non-perfumery substances like amino-acids, on the other hand, have entirely different taste from their optical isomers. Neither chemical reactivity nor chemical action between taste organs and these compounds is responsible for the sweet taste. A molecule as a whole must play the important part, probably through such medium as molecular vibration, resonance, or electrical vibration. Various reasons are given to show that the factors responsible for taste and odour are not necessarily the same. *Peryllartine*, *a*-antiperylla aldoxime, is a new perfume with a sweet taste. It is not so irritating as anisaldoxime and benzaldoxime, and is not toxic to higher animals. It is the sweetest compound on record, being 2,000 times sweeter than cane-sugar, and several times sweeter than saccharin. When given to the higher animals, it is eliminated as gluconic acid. Taste of peryllaldehyde and its derivatives are given, their relative sweetness being shown. In the second paper the author reports that acetophenone oxime tastes sweet, and so his statement that no oximes of ketones in perfumery are known to have a sweet taste is corrected.—W. D. H. (*Chem. Abstr.*).

1727. Residual Affinity Odour Theory. T. H. Durrans (*Perf. Essent. Oil Rec.*, 1920, **11**, 391-3).—Numerous odorous compounds have some inherent characteristic apart from questions of solubility or physiological action, termed "residual affinity." Odorous compounds frequently give evidence of the possession of free "residual affinity," as, for instance, the ease with which they form double or addition products, although the property is not confined to such compounds. It is not unlikely that the chemical reaction which gives rise to the sense of odour is an addition reaction (except in the case of sternutatory and similar substances, when the action is destructive). The probable sequence of events after the substance has reached the nostrils is first a solution of that substance in the aqueous outer layer, thence passing partially to the lipoid fats, and in these fats an addition reaction occurs, causing a change of energy which produces a sensation perceptible to the nervous centre. The particular smell experienced would depend on the velocity, the kind and the number of addition reactions taking place.—W. D. H. (*Chem. Abstr.*).

1728. Teudt's Resonance Theory of Odour. S. Kodama (*J. Tokyo Chem. Soc.*, 1920, **41**, 975-7).—The author's theory is similar, and was published before Teudt's paper reached Japan (see Abstracts No. 2990, Vol. IV., p. 484, and No. 136, Vol. V., p. 21).—W. D. H. (*Chem. Abstr.*).

PSYCHOLOGY

1729. Elementary Psychology in General Hospital Teaching. W. Calwell (*Brit. Med. J.*, 1921, i., 736-8).—The introduction of a simple elementary study of psychology into the wards of a general hospital is advocated.—D. H. de S.

1730. Der exakte Subjektivismus in der neueren Sinnesphysiologie. A. Tschermak (*Pflüger's Arch.*, 1921, **188**, 1-20).—A philosophical dissertation. The views held by the author are unintelligible to the uninitiated.—C. L. E.

1731. Habit Formation in Birds. I. Visual Sensations. Lucie W. Schut (Kon. Acad. v. Wetensch., Amsterdam, *Proc.*, 1920, **23,** 338-41).—Experiments are described which confirm Buytendijk that the place a food-box occupies among other empty boxes is of importance in the teaching of the birds to eat from that box. Numerous other visual factors tend to develop the habit.—W. D. H.

1732. Integration of Movements in Learning in the Albino Rat. J. L. Ulrich (*Psychobiol.*, 1920, **2,** Nos. 5 and 6; *Compar. Psychol.*, 1921, **1,** Nos. 1, 2, and 3, reprint, 322 pp.).—Learning consists in the facilitation of fundamental movements, not the creation or establishment of new paths, or reintegrations in the nervous system. Variations in the functional condition of an organism at any time in its life cycle is a better explanation for behaviour than a consideration of "habits," "instincts," and "intelligence." Full details of the experiments on rats in mazes, on inclined planes, etc., are given.—W. D. H.

CEREBRO-SPINAL FLUID

1733. Acetone in Cerebro-Spinal Fluid. J. Koopman (*Ned. T. v. Geneesk.*, 1920, **64,** 1346; compare Abstract No. 1826, Vol. V., p. 288, where the author's name is incorrectly printed Koolman).—In rabbits the normal choroidal plexus is not permeable to acetone; it becomes permeable after chloroform-poisoning. In severe cases of acidosis, acetone and diacetic acid are found in the cerebro-spinal fluid.—R. B.

1734. Cholesterol in Cerebro-Spinal Fluid. A. Levinson, L. L. Landenberger, and K. M. Howell (*Amer. J. Med. Sci.*, 1921, **161,** 561-7).—The normal fluid contains none, or only a trace; its presence depends on the permeability of the meninges, and it is found in a variety of pathological states (grouped under 5 headings); it is not the cause of the Wassermann reaction.—W. D. H.

1735. Xanthochromie der Zerebrospinalflüssigkeit. E. Leshke (*Deutsch. med. Woch.*, 1921, **47,** 376-7).—The yellow colour not infrequently seen in cases where red cells escape into the cerebro-spinal fluid is due to formation of bile-pigment from hæmoglobin by the cells of the meninges.—W. D. H.

BLOOD

1736. Effect of Temperature on the Reaction of Blood. J. M. de Corral (*Anal. fis. quim.*, 1920, **18,** 109-18).—A discussion of the influence of temperature on the H and HO-ion concentrations of blood and serum. Attention is directed to the effect of equilibration with CO_2. The P_H of blood is not affected by changes of temperature, provided the blood is equilibrated with CO_2.—W. D. H. (*J. C. Soc.*).

1737. Das spezifische Gewicht des menschlichen Blutes und Blutserums. H. Arndt (*Berlin. klin. Woch.*, **58,** 204-6).—All results by Roy's method and its many modifications are incorrect and much too high. The only satisfactory method is gravimetric, or an accurate micro-pycnometer. The sp. gr. of normal human blood is 1·02, and of serum 1·01; variations occur only beyond the second decimal place. These constants are not affected by the number of red and white corpuscles. The blood constant is determined by the normal oxygen capacity of Hb. The essential feature of the serum constant is not known. The cause of variations in third and following decimal places is also unknown (noch dunkel).—W. D. H.

1738. Blood-Volume and its Regulation. J. Erlanger (*Physiol. Reviews*, 1921, **1,** 177-207).—A review. The various methods of determining blood-volume are grouped according to underlying principles; each of the more important groups, with related

problems, is examined critically. The same general phases of the question are reviewed in relation to the problem as a whole, and in relation to certain specific problems. There is a copious bibliography.—J. A. H.

1739. Modifications sanguines après transfusions. H. Bulliard (*J. de physiol. et de pathol. gén.*, 1921, **19,** 80-91).—The transitory increase in number of red cells is followed by a decrease lasting for 2 to 5 days. This is due to a reciprocal hæmolysis of the two bloods. In regeneration the cells increase more rapidly than the hæmoglobin. The time of regeneration varies from case to case. There is a rapid appearance of polychrome red cells. Nucleated red cells are rare. Mononuclear plasma cells, strongly basophile, are often met with. These appear to be the result of excitation of hæmatopoietic organs. The favourable results of transfusion are not due to increase of corpuscles, but to the re-establishment of a normal circulation.—W. M. B.

1740. Red Cell "Refusion" in Horses. Presid. Address, Sect. of Pathol., Australasian Med. Congress, Brisbane, 1920. W. J. Penfold (*Med. J. Australia*, September 25, 1920, reprint, 32 pp.).—The blood is collected into oxalate, and the red cells quickly settle. The supernatant plasma is used after recalcification for the preparation of antitoxic serum (details of this part will interest pathologists). The red cells are then returned via a vein to the horse without detriment. They persist and perform their function; horses have been bled 60 litres in 10 days, and no anæmia resulted. No reference is made to what must occur—viz., the simultaneous injection of calcium oxalate—so one supposes it can do no harm. The point of the experiment is that this new procedure enables one to bleed a horse to the extent of 6 to 10 litres every other day, or every day; even twice a day was attempted; the usual interval of a week or so between bleedings is not necessary; this is a consideration of importance in collecting large amounts of serum at the time of its highest antitoxic potency. It is suggested that the reinjection in man of his own red cells in gum solution might be of use, and the method lends itself to the investigation of such questions as the regeneration of blood-plasma. —W. D. H.

1741. The Effects of Citrates, Malates, and Phosphates upon the Calcium of the Blood. G. W. Clark (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 165-6).—Repeated subcutaneous injections of citrate, malate, or phosphate, have no effect on the Ca balance of animals receiving a Ca rich diet. The Ca content of the blood may be temporarily decreased by the injection of large doses of citrate. Animals on a low Ca intake may, after phosphate injection, show a decrease in the Ca content of the blood and still maintain a positive Ca balance. The suggestion that animals may adjust themselves to different "Ca levels" is emphasised.—D. H. de S.

1742. Über "photographischen" Bromnachweis im Serum. F. Merke (*Schweiz. med. Woch.*, 1921, **51,** 200-2).—The method described by Kottmann was used (*ibid.*, No. 30). After adding of KI and $AgNO_3$ solutions to the serum and exposing it to sunlight the duration of the reduction of the Ag by hydroquinone was determined. The sensitiveness to light depends upon the degree of dispersity of the colloids present. Serum containing Br shows a great increase of the time of reduction just as bromides inhibit the development of the photographic plate. To determine the degree of reduction, a colorimetric scale was made, but it has no quantitative exactness. After small doses of bromide per os the reaction can be observed in the serum in 60 to 90 mins., and lasts about 8 to 9 hours.—H. W.

1743. Über die auxoureatische Funktion des Serums. M. Jacoby (*Biochem. Zeit.*, 1921, **114,** 152-6).—The recent communication of Rona and György (Abstract No. 99, Vol. VI., p. 14) on this subject confirms in the main the results of Falk and Umeda (*Biochem. Zeit.*, **59** and **68**) obtained in the author's laboratory.—H. K.

1744. Über die Verteilung des Kalkes auf Blutkörperchen und Plasma. Zugleich ein Beitrag über das Verhalten des Blutkalkes nach Kalkfütterung. M. Richter-Quittner (*Wien. Arch. f. inn. Med.*, 1921, **11**, 217-32).—The red corpuscles of men and of other animals (cows, cats, dogs, horses, rabbits), with the exception of the goose, do not contain Ca, neither under physiological nor under pathological conditions. Ca salts given per os effect an increase of the total Ca content and of the free Ca in the plasma. Under these conditions Ca enters also into the red blood-corpuscles.—H. W.

1745. Globulins et temps de saignement. J. Roskam (*Compt. rend. soc. biol.*, 1921, **84**, 844-6; *C. r. de la soc. belge de biol.*, 1921, 64-7).—The author produced a temporary disappearance of globulin from the blood of a dog by means of intravenous injections of an isotonic solution of gelatin. There was no effect on the clotting time. Determinations of globulin in the blood of patients in whom the coagulation time was much prolonged gave normal results. The idea held by many that the cause of delayed clotting time in certain hæmorrhagic maladies is deficiency in globulin is not therefore confirmed by these experiments.—J. H. B.

1746. De l'obtention de la thrombozyme à l'état de pureté. P. Nolf (*Compt. rend. soc. biol.*, 1921, **84**, 840-3; *C. r. de la soc. belge de biol.*, 1921, 60-3).—Tissue extracts contain two substances which influence blood-coagulation—namely, "thrombozyme," which is specific, and a "thromboplastic" substance which is not. The preparation of thrombozyme in pure form from horse oxalate plasma is described. It is the substance described by Wooldridge as thrown down from dog's peptone plasma at 0° C. The pure substance thus prepared is only capable of reacting with the thrombogen of mammals, and not with that of birds or fish.—J. H. B.

1747. Sodium Hydroxide and Coagulation of Fibrinogen. J. O. W. Barratt (*Biochem. J.*, 1921, **15**, 4-10).—NaOH, added in increasing amounts to citrated plasma, causes the gradual disappearance of fibrinogen; the fibrin fibrils observable in the gel formed on the addition of thrombin diminish in size and number, and ultimately pass out of the range of ultramicroscopic visibility. At this stage, gel formation may be still observable, but the gel obtained is structureless under microscopic illumination, being made up of amicroscopic fibrils; with further disappearance of fibrinogen, gel formation ceases. The alkali has no action on thrombin.—J. A. H.

1748. Eine Fehlerquelle bei der Bestimmung der Retraktilität des Blutkuchens. H. Opitz and G. Matzdorff (*Deutsch. méd. Woch.*, 1921, **47**, 504-5).—1 c.c. of blood normally yields 0·05 c.c. of serum. The amount and rate of the retraction of the clot varies, and this has been supposed in disease to be of diagnostic value. The authors point out that differences in the state of the wall of the containing glass vessels is a more important factor.—W. D. H.

1749. Die Bedeutung der Blutsedimentierungsreaktion nach Fahraeus für die Geburtshelfe und Gynäkologie. F. Geppert (*Berlin. klin. Woch.*, 1921, **58**, 226-7).—Beyond the 4th month this test (see Abstract No. 1248, Vol. VI., p. 186) is a practical biological sign of pregnancy, and serves to distinguish that condition from tumours, ectopic pregnancy, diseases of the adnexes, and infective processes in general.—W. D. H.

1750. Über Agglutination und Senkungsgeschwindigkeit der Erythrocyten. W. Starlinger (*Biochem. Zeit.*, 1921, **114**, 129-44).—The rate of sedimentation of corpuscles is more or less a measure of the degree of agglutination. Increase in the fibrinogen content runs parallel with increased velocity of sedimentation. The results are interpreted in terms of the Herzfeld-Klinger theory (Abstract No. 2774, Vol. II., p. 660).—H. K.

1751. The Resistance (Osmotic Fragility) of Red Blood Cells in Relation to their Volume, Hæmoglobin Content, Specific Gravity, and Viscosity of the Blood in Various Diseases. N. P. v. Spanje (*Ned. T. v. Geneesk.*, 1921, **65**, 274).—The various data

were obtained by well-known methods, and their relationships discussed. The results cannot be grouped in any systematic way.—R. B.

1752. Electric Charges of the Red Blood-Corpuscles. K. Kosaka and M. Seki (*J. Okayama Med. Assoc.*, Japan, 1921, No. 372, reprint, 34 pp.).—Erythrocytes bear different charges according to the species of animal and the nature of the solution under observation. The variability of the charge is dependent on the permeability of the membrane of the corpuscles, especially to cations.—R. K. S. L.

1753. Über die chemische Zusammensetzung der Blutkörperchen. W. Falta and M. Richter-Quittner (*Biochem. Zeit.*, 1921, **114,** 145-51).—Further experimental evidence in support of the previous findings of the authors that corpuscles of man and a variety of animals under normal physiological conditions do not contain chloride, sugar, or non-precipitable nitrogenous substances. The presence of these constituents in corpuscles extra corpus is ascribed to injury of the corpuscle, which may be brought about in a variety of ways.—H. K.

1754. Das Blutbild und die Blutplättchen unter den Einfluss intravenös injicierten Ca. O. A. Rösler (*Wien. Arch. f. inn. Med.*, 1921, **11,** 281-92).—Intravenous injections of Ca cause a 6 to 18% increase of the polynuclear, neutrophile leucocytes at the expense of the lymphocytes. The total number of colourless corpuscles does not increase. The change lasts a few hours. A diminution of the thrombocytes and a shortening of the time of coagulation were also observed.—H. W.

1755. Zur Lösung der Blutplättchenfrage. V. Schilling (*Deutsch. med. Woch.*, 1921, **47,** 178).—Polemical on the origin of platelets, especially against Degkwitz (Abstract No. 239, Vol. VI., p. 35).—W. D. H.

1756. Die Differenzierung der Blutplättchen. H. Zeller (*Deutsch. med. Woch.*, 1921, **47,** 505-6).—Differences of size, shape, staining reactions, and capacity to agglutinate occur, and these may be of diagnostic value in disease. Further work is in hand.—W. D. H.

1757. Über die Notwendigkeit exakter absoluter Hämoglobinbestimmungen und Erythrozytzählungen. K. Bürker-Giessen (*Münch. med. Woch.*, 1921, **68,** 571-3).—A colorimetric method of obtaining accurate hæmoglobin values of blood. A standard hæmoglobin solution is used which is calibrated (1) by spectrophotometric comparisons with a solution prepared from hæmoglobin crystals, and (2) by analysis of the Fe content. The author counts red cells with an apparatus of his own, whereby the 7% error he describes as unavoidable in Thoma-Zeiss counts is reduced to 0·7 to 0·8%. This error is due to the settling down of the red cells. Using these methods, it is found that while the absolute hæmoglobin values and the red counts vary considerably, nevertheless, in man and several domestic animals, the amount of hæmoglobin per red cell is constant. —J. H. B.

1758. Nouvelle réaction chimique pour la recherche de l'oxyde de carbone dans le sang. E. Stockis (*Compt. rend. soc. biol.*, 1921, **84,** 743-5; *C. r. de la soc. belge de biol.*, 1921, 35-7).—A 10% solution of $ZnCl_2$ gives a greyish-brown precipitate with normal blood, but blood containing CO Hb remains cherry red and clear. The reaction is more sensitive than previous tests, and is still evident when blood is taken from a corpse, at a dilution of 1 in 100, and when the CO saturation is only 2·5 c.c. per litre.—J. H. B.

HEART

1759. Fötale Electrokardiogramme vom Pferd. J. Nörr (*Zeit. Biol.*, 1921, **73,** 123-28).—To obtain the currents from the fœtal heart, the electrodes must be placed in the iliac region of both sides. The method is useful for determining pregnancy in mares.—H. W.

1760. Electrokardiogrammstudien am Rind. J. Nörr (*Zeit. Biol.*, 1921, **73,** 129-40).—The curves obtained were analysed. The auricular wave usually shows 2 culminations, and lasts 0·1 sec. The time of conduction also lasts 0·1 sec. The conduction of excitation in the A.V. bundle is expressed also by an action current in the curves. The duration of one-heart beat is 0·55 sec.—H. W.

1761. An Electrocardiogram and an Electromyogram in an Elephant. A. Forbes, S. Cobb, and McK. Cattell (*Amer. J. Physiol.*, 1921, **55,** 385-9).—The rate of the heart was 41 per min. The electrocardiogram and electromyogram were essentially similar to those obtained from man.—W. M. B.

1762. Gaswechsel und mechanische Leistung des Froschherzens—III. E. Lüscher (*Zeit. Biol.*, 1921, **73,** 67-100).—The arrangements for isotonic and after-load contractions of the former paper (Abstract No. 273, Vol. VI., p. 40) were modified by the introduction of an adjustable resistance on the arterial side similar to that used in the Starling heart-lung preparation. The oxygen usage of the heart increases with increase of this resistance for isotonic contractions of low initial pressure (100 mm. H_2O), but remains unchanged when the initial pressure is high for isotonic and after-load contractions. The maxima of oxygen consumption, total measurable work, and effective work are the same as for the other modes of contraction previously dealt with, but the mechanical efficiency is generally a little higher (33% the maximum). Maximal work and mechanical efficiency are given when the contraction starts from a low initial pressure, and has a high after-load with moderate resistance—*i.e.*, when the conditions *in vivo* are reproduced. Mathematical considerations indicate that the heart-muscle efficiency depends on the length of the fibres when contraction is initiated, and on the duration of the contractile process. A considerable portion of the potential mechanical energy of contraction is utilised in overcoming "internal friction"; when this is taken into account, the efficiency may be as great as 40%.—H. W.

1763. Factors Modifying the Duration of Ventricular Systole. L. N. Katz (*J. Lab. and Clin. Med.*, 1921, **6,** 291-311).—The temporal variations of the cardiac phases in dogs with normal circulations were determined from optical records of the heart-sounds. The duration of systole is normally modified to a large extent by the heart-rate, according to a uniform cardiac action conception, such as Henderson put forward. Other influences, however—for instance, alterations of arterial and venous pressure, the specific action of the accelerator nerves, and those occurring during changing heart-rate, and even naturally from beat to beat—are capable of producing deviations from this uniform action in an animal with a normal circulation. A detailed study of the temporal lengths of these phases in recognised and suspected cardiac diseases is considered desirable.—D. H. de S.

1764. The Influence of Venous Return and Arterial Resistance on the Pressures within the Right and Left Ventricles. C. J. Wiggers (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 144-6).—The pressure changes in the right and left ventricles during the early response of the right heart to changes in venous inflow and arterial resistance were studied in animals. The venous inflow was increased by allowing a graded inflow of normal saline into the jugular vein. Increased arterial resistance was produced by partial compression of the thoracic aorta. The results favour the conclusions that initial tension changes are apparently always associated with changes in initial length of the muscle fibres resulting from alterations in venous inflow or arterial resistance, and that, in the intact animal, changes in initial tension play the predominant rôle in determining the response of the mammalian ventricle.—D. H. de S.

1765. The Present Status of Cardiodynamic Studies on Normal and Pathological Hearts. C. J. Wiggers (*Arch. Int. Med.*, 1921, **27,** 475-502).—A lecture dealing with the current views of the factors governing output. The application of results obtained

with the heart-lung preparation to the normal animal is severely criticised. The author inclines to the idea that systolic output does not so much depend on venous inflow as on the initial tension inside the ventricle, and he invokes the conception of varying degrees of tone to explain the difference between one normal heart and another.—J. H. B.

1766. Effect of Warming and Cooling the Sino-Auricular Node in the Mammalian Heart. Depth of Anæsthesia, Tachycardia, Flutter, Sino-Auricular Heart-Block. B. H. Schlomovitz (*Amer. J. Physiol.*, 1921, **55**, 462-84).—The normal locus of the pace-maker, as tested by local warming and cooling, is unaltered even in deeply anæsthetised animals. Atropine does not affect this result. Persistent tachycardia cannot be produced, even under atropine, by continuous warming of the node. A tachycardia with sudden onset and termination and of short period may be produced experimentally. Auricular flutter can sometimes be produced by warming the node. Probable sino-auricular heart-block may be obtained.—W. M. B.

1767. Experimental Production of Ventricular Fibrillation by Localised Warming of Cardiac Tissue. B. H. Schlomowitz (*Amer. J. Physiol.*, 1921, **55**, 485-8).—In the toxic stage of digitalis action, in which the ventricles are beating independently, localised warming of the ventricle will initiate fibrillation, which may disappear on cessation of the warming, and be repeatedly induced.—W. M. B.

1768. Interpolated Contractions of the Heart, with Especial Reference to their Effect on the Radial Pulse. M. M. Myers and P. D. White (*Arch. Int. Med.*, 1921, **27**, 503-14).—Extra systoles may arise in the ventricles themselves which do not interfere with, and are additional to, the normal beats due to impulses coming through the A.V. bundle. These are interpolated beats, and are not to be confused with premature ventricular contractions. While the existence and nature of interpolated beats is obvious in an electrogram, this is not the case when arteriograms are used, for usually an interpolated beat does not appear in an arteriogram at all. The only indication of the presence of interpolated beats in an arteriogram may be the reduction in size of the succeeding normal beat. Hence interpolated beats must not be confused with two premature ventricular beats in succession, pulsus alternans, in which there is a delay in the weaker beats, a 2 : 1 block in which there is occasional escape, short paroxysms of tachycardia, or premature beats which fail to appear in the arteriogram.—J. H. B.

1769. L'arythmie complète du cœur (fibrillation auriculaire) et sa disparition sous l'influence du sulfate de quinidine. R. Wybauw (*Bull. soc. sci. méd. et nat. Bruxelles*, 1921, 19-23).—L'auteur a employé dans ving-cinq cas la quinidine à la dose de 1 gm., 1·25 gm. et même 1·5 gm. pendant deux jours. La fibrillation n'a pas été modifiée dans onze cas. Elle a cessé dans les autres cas pour un laps de temps variable. Des cures alternatives de digitale et de quinidine fournissent de bons résultats thérapeutiques.—E. Z.

1770. Auricular Flutter and Fibrillation in Pregnancy. C. P. Thomas (*J. Amer. Med. Assoc.*, 1921, **76**, 1227-9).—An apparently typical case which yielded to digitalis.—C. L. E.

1771. Fortgesetzte Untersuchung über Kammerflimmern. S. de Boer (*Pflüger's Arch.*, 1921, **188**, 67-75).—Stimulation of the ventricle directly after the subsidence of the refractory phase is especially liable to lead to fibrillation if the ventricular contraction was a premature one originating from an auricular extra systole. While the ventricle fibrillates the auricular rhythm may either persist undisturbed, or may be broken by premature contraction resulting from retrograde conduction from the ventricle. Ventricular fibrillation can also follow on periodic sinus impulses reaching the ventricle just after the refractory period (see Abstracts Nos. 290 and 1287, Vol. VI., pp. 43, 191).—C. L. E.

1772. Über die Beziehungen zwischen Herzmittel- und physiologischer Kationenwirkung—VI. O. Loewi (*Pflüger's Arch.*, 1921, **188,** 87-97).—A previous observation (Abstract No. 3120, Vol. III., p. 533) that in presence of digitalis or excess of Ca, addition of K salts to the perfusion fluid of the frog heart causes contracture, is investigated. It is found to occur in the isolated ventricle, and it is believed that K is essential to the occurrence of Ca contracture, which it facilitates by greatly increasing the excitability of the tissue. In fact, K contracture is in reality Ca contracture consequent on this, and does not appear in an unstimulated heart.—C. L. E.

1773. Cardiac Standstill with Syncope following Pressure on Right Vagus Nerve. W. B. Blanton and H. W. Blanton (*J. Amer. Med. Assoc.*, 1921, **76,** 1220-2).—Description of a case of this not uncommon phenomenon.—C. L. E.

1774. Le paradoxe radio-physiologique. H. Zwaardemaker (*Compt. rend. soc. biol.*, 1921, **84,** 704-6).—When in perfusing a frog heart with Ringer's solution the perfusion fluid is changed from one containing thorium to one containing potassium, or *vice versa*, a complete arrest of the beats occurs lasting from 30 to 34 secs. There is no other effect. This is explained by saying that at the moment of change there are equal amounts of α and β rays present which neutralise one another.—J. H. B.

CIRCULATION

1775. Pression artérielle et travail musculaire. P. Chailley-Bert and J. P. Langlois. (*Compt. rend. soc. biol.*, 1921, **84,** 725-7).—Observations taken with Pachon's oscillograph during static work and during exercises give the following results: The systolic pressure increases rapidly at first, then more slowly till the end of work. At the end of work there is a rapid fall (in 5 secs.) to the initial value, and then a second considerable rise which slowly passes off. The curve for diastolic pressure is similar, but the fall at the end of work may be to a level below the original pressure, and similarly, as the rise following this fall is passing off, the diastolic pressure becomes less than at rest.—J. H. B.

1776. Effect on Blood-Pressure and the Non-Protein Nitrogen of the Blood of Fluid Intake. J. L. Miller and J. L. Williams (*Amer. J. Med. Sciences*, 1921, **161,** 327-34).—Observations in 3 cases. Large amounts of fluid food (10 litres) raise arterial pressure, the rise depending on the promptness of the kidneys to respond. During 6 days' observation there was no effect on the urea N of the blood; the N eliminated in the urine was not observed. In 2 cases the uric acid of the blood fell, but this was probably due to treatment.—W. D. H.

1777. Pulse-Rate and Blood-Pressure Responses of Men to Passive Postural Changes. M. M. Ellis (*Amer. J. Med. Sciences*, 1921, **161,** 568-78).—Changes to various tilts are described in full. They vary a good deal. The investigation sprang from testing airmen.—W. D. H.

1778. The Influence of Rhythm on the Pulse-Rate. J. H. O. Reys (*Ned. T. v. Geneesk.*, 1920, **64,** 141).—The pulse-rate was found to be greatly influenced by the rhythms the person was hearing (compare Colman, Abstract No. 3426, Vol. V., p. 545). —R. B.

1779. Sur la détermination oscillométrique de la pression moyenne dynamique du sang dans les artères ou pression efficace arterielle. V. Pachon. **Sur le critère de la pression minima dans la méthode oscillométrique.** V. Pachon and R. Fabre (*Compt. rend. soc. biol.*, 1921, **84,** 868-74).—Experiments to determine the constant pressure which, when exerted on the arterial system, would produce the same flow as the pulse pressure produced by the heart.—J. H. B.

1780. The Pressure in the Renal, Portal, and Glomerular Capillaries of the Frog's Kidney. L. Hill (*Brit. Med. J.*, 1921, i., 526).—By means of the apparatus of Roy and Graham Brown the author has measured the pressure in the capillaries of the frog's kidney. This pressure is of the same order of magnitude as that in the capillaries of the frog's foot (see Abstract No. 3445, Vol. V., p. 547).—D. H. de S.

1781. Reactions to Hæmorrhage. W. J. Meek and J. A. E. Eyster (*Amer. J. Physiol.*, 1921, **56**, 1-15).—In the normal dog there is no diminution in the diastolic volume of the heart until hæmorrhage to the extent of about 2·1% of the body-weight has taken place. In the anæsthetised animal the figure is 1·2%. It is suggested that the cardiac output is maintained by constriction of capillaries and venules, since this may be seen to occur in the ear when the loss amounts to 2%.—W. M. B.

1782. The Lymphatics in Experimental Œdema. E. L. and E. R. Clark (*Anat. Rec.*, 1921, **21**, No. 2).—Œdema was produced in tadpoles and chicks in various ways. Lymphatic capillaries develop normally and absorb lymph with the blood circulation hampered or absent. When the outlet of fluid from the lymphatics is interfered with, they become distended. Collection of fluid in the tissue spaces is associated with enlargement of the lymphatic capillaries. This result is the opposite of the view generally held by pathologists, that lymphatic capillaries are collapsed in œdema.—W. D. H. (*W. I.*).

RESPIRATION

1783. The Determination of Lung Volume without Forced Breathing. D. D. Van Slyke and C. A. L. Binger (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 141-2).—The subject breathes into and from a bag containing sufficient oxygen to satisfy his requirements for the duration of the experiment. Mixed with the oxygen is a known volume of hydrogen, approximating to the volume of the nitrogen in the lungs. CO_2 is removed by NaOH. After mixture is complete the nitrogen and hydrogen in the gas are determined. Since

$$\frac{\text{initial vol. } N_2 \text{ in lung air}}{\text{initial vol. } H_2 \text{ in bag}} = \frac{\text{final } N_2\% \text{ in gas mixture}}{\text{final } H_2\% \text{ in gas mixture}}$$

the initial volume of nitrogen in the air of the lungs can be ascertained, and, since the nitrogen constitutes 79% of the air, the volume of air in the lungs can be calculated. Corrections have to be made for the dead space of the apparatus and for air present as an impurity in the oxygen or hydrogen used. The error of the method appears not to exceed 4% of the lung volume estimated.—D. H. de S.

1784. Residualluft und Reserveluft. R. Geigel (*Münch. med. Woch.*, 1921, **68**, 576-7).—The total area of lung surface is more than 40 times as great as the total area of body surface of an ordinary man. Yet the loss of heat by way of the lungs is normally very small ($\frac{1}{6}$ of the total). The protective action of the residual air must therefore be of the very first importance. It is, for example, adequate when the external air is 40° to 50° below freezing-point, and for short periods when in a bakehouse the external air is as much as 132° C.—J. H. B.

1785. Artificial Respiration in New-Born Children. W. O. Greenwood (*Lancet*, 1921, i., 964-5).—When this is necessary, the diaphragm can be stimulated to fall and rise by alternately placing the child upright and upside down without violence. The abdominal viscera thus fall from and on to the diaphragm.—W. D. H.

1786. Blood as a Physico-Chemical System. L. J. Henderson (*J. Biol. Chem.*, 1921, **46**, 411-9).—By a series of co-ordinates projected on to one plane a nomogram is produced from which one can determine the concentrations of the 6 variables, free and combined oxygen, free and combined CO_2 of the serum, serum chloride, and H-ion

concentration, if any 2 of these concentrations are known. It is suggested that these 6 variables are involved in a single physico-chemical equilibrium.—H. E. R.

1787. Specific Oxygen Capacity. H. Engelkes (*Proc. 18th Ned. Nat. en Gen. Congress*, date, page, etc., not stated).—The iron of the blood and its oxygen capacity are parallel; the drop in oxygen capacity is seen in pernicious anæmia, but not in secondary anæmia and acute infections.—R. B.

1788. The Regulation of the Pulmonary Circulation. C. J. Wiggers (*Physiol. Reviews*, 1921, **1**, 239-68).—A review. The following are discussed: (1) Methods employed to study the pulmonary circulation; (2) normal pressure variation and blood content of the pulmonary circuit; (3) the mechanical factors concerned in the dynamics of the pulmonary circulation; (4) the nervous control of the pulmonary vessels; (5) the chemical regulation of the pulmonary vessels; (6) the cardiac regulation of the pulmonary circulation.—J. A. H.

1789. Visceral Sensory Nervous System. VIII. On the Presence of Vasomotor Fibres in the Vagus Nerve to the Pulmonary Vessels of the Amphibian and the Reptilian Lung. A. B. Luckhardt and A. J. Carlson (*Amer. J. Physiol.*, 1921, **56**, 72-112).—Section of vagi causes vaso-dilatation; that of the cervical sympathetic has no effect in the turtle. Stimulation of the peripheral end of the vagus gives vaso-constriction. In the perfused lung, adrenaline in small doses is vaso-dilator; in larger doses, constrictor. Histamine and pituitrin are constrictor. Atropine paralyses the vagus effect. It seems doubtful whether the vaso-constrictor effect from the vagus might not be due to contraction of lung muscle.—W. M. B.

1790. Über das Gähnen. C. Mayer (*Zeit. Biol.*, 1921, **73**, 101-14).—The phenomena occurring during yawning were investigated on normal persons, and the phases described (investigations with Röntgen rays and the laryngoscope, etc.). The progress of the motor phenomena occurs in subcortical centres, independent of the cortex. The different causes of yawning are discussed. Disturbances of yawning, characterised by incomplete progress and slow reaction, were observed in cases of encephalitis lethargica. They were combined with disturbances in sleeping.—H. W.

ALIMENTARY CANAL

1791. Sur la composition chimique d'une salive dans un cas de sialorrhée. R. Clogne and R. Richaud (*Bull. de la soc. de chimie biol.*, 1921, **3**, 69-70).—An analysis of saliva, secreted at a rate of 2 to $2\frac{1}{2}$ litres per day, in a case of an epithelioma of the palate. Traces of urea, thiocyanate, protein, and a large amount of polynucleated leucocytes were found. The saliva was free from sugar.—G. V. A.

1792. Persistance, après la surrénalectomie double, du réflexe salivaire causé par l'excitation du nerf sciatique. E. Gley and A. Quinquaud (*Compt. rend. soc. biol.*, 1921, **84**, 706-8).—It is still possible to obtain reflex salivary secretion in dogs by stimulating the central end of the sciatic after both suprarenals are extirpated, provided that there is a short interval after decapsulation before the stimulation is begun.—J. H. B.

1793. Automatic Movements of the Mammalian Œsophagus. J. R. Prakken (*Ned. T. v. Wetensch.*, 1920, **64**, 222).—See Abstract No. 2605, Vol. V., p. 413.—R. B.

1794. Physiology of the Stomach. LV. The Influence of the Vagi on Gastric Tonus and Motility in the Turtle. Z. Bercovitz and F. T. Rogers (*Amer. J. Physiol.*, 1921, **55**, 323-38).—Stimulation of the peripheral end of the vago-sympathetic with induced shocks (2,400 per min.) causes, after a latent period, a brief inhibition of gastric tonus, followed by contraction. The effect of repetition is a lengthening of the latent period, a decrease in the amplitude of contraction to a stage in which it is absent. At this

stage, the other vagus may or may not cause contraction. Induced shocks at 30 to 40 per min. cause relaxation, which may not involve inhibition of rhythmical contractions. These shocks do not lead to failure of inhibitory response when repeated at intervals. Excitation or inhibition depends on rate, and not on intensity. The cervical sympathetic has no effect, reflex or direct. Section of vagi causes long-tonic contraction. Small doses of nicotine cause brief inhibition. After lasting larger doses the vagus causes inhibition only. After atropine the vagus is inhibitory. —W. M. B.

1795. Physiology of the Stomach. LVI. Gastric Secretion in Starvation. LVII. The Response of the Stomach Glands to Gastrin before and shortly after Birth. G. F. Sutherland (*Amer. J. Physiol.*, 1921, **55,** 390-403).—There is a continuous gastric secretion in the dog during starvation, showing periods of more rapid secretion. If water is given daily, the secretion decreases day by day. If physiological saline, the amount is the same at the end of the period as at the beginning. There may be a spontaneous secretion during late intra-uterine life in the guinea-pig, but not in the cat or dog. In these latter there is some response to gastrin within a few days of term. Such secretory response increases during the first few days after birth.—W. M. B.

1796. Gastric Analysis. III. The Examination of the Abnormal Gastric Residuum. W. W. Lermann, M. E. Rehfuss, and P. B. Hawk (*J. Amer. Med. Assoc.*, 1921, **76,** 1340-2).—Examination during the interdigestive (fasting) state is important as revealing pathological exudates, blood, swallowed muco-pus, etc., liable to be obscured by the presence of food. The volume of the residuum does not normally exceed 100 c.c., and is usually about 50 c.c.—C. L. E.

1797. Variations in Acid Concentration in Different Portions of the Gastric Chyme, and its Relation to Clinical Methods of Gastric Analysis. F. D. Gorham (*Arch. Int. Med.*, 1921, **27,** 434-40).—A paper stating that the total acidity and free HCl vary at any one moment in different regions of the stomach. Eleven samples (10 c.c. each) withdrawn in rapid succession 45 mins. after a test meal varied from free HCl a trace to 106. This was a patient with a perforating duodenal ulcer. Other patients showed less variation than this, but the results seem, nevertheless, striking.—J. H. B.

1798. Über das Regurgitation von Duodenalinhalt in den Magen. L. Jarno and J. Vândorfy (*Deutsch. med. Woch.*, 1921, **47,** 381).—Clinical cases are recorded which support Boldyreff's view that HCl produced in, or introduced into, the stomach promotes regurgitation from the duodenum.—W. D. H.

1799. Structure and Function of the Small Intestine. E. J. Carey (*Anat. Rec.*, 1921, **21,** No. 2).—The inner muscular coat of the small intestine is a continuous muscular sheet wound in a close spiral. The outer muscular coat forms an elongated spiral which makes one complete turn in every 200 to 500 mm. or more. The difference in rate of translatory progression of the contraction waves depends upon this arrangement. The wave travelling in the inner group of fibres takes a rotary course, whereas that in the outer fibres takes a more translatory course to reach a corresponding destination. Therefore, the contraction of the stronger inner muscle coat will inevitably trail that of the outer. The arrangement of the intestinal muscle layers explains the phenomenon of cephalic constriction and caudal dilatation of diastalsis without invoking the aid of hypothetical nerve paths. Peristalsis is a duplex contraction phenomenon produced by the differential rate of translatory advance of the contraction waves in the outer and inner muscle layers respectively. These conclusions are based on experiments in which the outer and inner coats were exsected in the living gut.—W. D. H. (*W. I.*).

1800. Formation of Inulinase in Intestine. (Miss) E. Sluiter (*Ned. T. v. Geneesk.*, 1921, **65,** 2268).—The gastric acid has no effect on inulin *in vivo* or *in vitro*. By feeding a dog on food containing inulin and examining the fæces, no evidence of the formation

of any inulinase was found. The author doubts whether the formation of new enzymes can be stimulated by foods given per os.—R. B.

1801. The Action of Histamine and Peptone on the Isolated Small Intestine. H. Olivecrona (*J. Pharm. Expt. Ther.*, 1921, **17**, 141-67).—An isolated loop of cat's intestine is stimulated by solutions of histamine and peptone, the same intensity of action in one experiment, for example, being obtained respectively by a histamine solution of 1 in 750,000 and a peptone solution of 1 in 7,500. Stronger solutions of both substances have inhibitory effects. As regards the rabbit's intestine, the characteristic effect of both histamine and peptone is inhibitory rather than stimulating, but there is great variability of response.—E. M.

1802. Sur la formation de l'urée dans le foie après la mort. R. Fosse and Mlle. N. Rouchelman (*Compt. rend.*, 1921, **172**, 771-2).—When liver pulp is allowed to undergo autolysis, the amount of urea may be increased sixfold. If the liver is previously boiled, this does not occur.—J. A. M.

DIET

1803. Energy Content of Extra Foods. III. Sandwiches. Cornelia G. Benedict and F. G. Benedict (*Boston Med. and Surg. J.*, 1921, **184**, 436-9).—As the sandwich is becoming an important American institution, data are given (weight, price, composition, caloric value) for 38 varieties. The calorie figures vary from 166 (corned beef) and 189 (jam) to 379 (shrimp) per sandwich; the figures are not strictly comparable, for the sandwiches vary in weight and in the amount of butter in them. (Compare Abstract No. 1496, Vol. V., p. 239.)—W. D. H.

1804. Calcium Deficiency in Food. M. Rubner (*Vierteljahrs. ger. Med.*, 1920, **60**, 1-26).—A report of the effect of the food blockade in Germany, with special reference to Ca deficiency.—W. D. H. (*Chem. Abstr.*).

1805. Om till godogörandet av margarin och smör in manniskans tarmcanal (Use of Margarine and Butter in the Human Intestine). R. Lundgren, H. Perander, and T. Putkonen (*Finska Läk. Handlingar*, 1921, **63**, 16-25).—Butter and margarine given with hard bread showed a utilisation of 94·8 and 94·4% respectively. The protein of the bread was used to the extent of 66·4, and the carbohydrate 88·4, and of total calories 90·6%.—W. D. H.

1806. Does Growth Require Preformed Carbohydrate in the Diet? T. B. Osborne and L. B. Mendel (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 136-7).—Rats receiving a diet in which the amount of digestible carbohydrate was at most exceedingly small can grow from an early age to adult size.—D. H. de S.

1807. Nutrition Studies. VI. Protein of Lima Bean (Phaseolus lunatus). VII. Proteins of Adzuki Bean (P. angulatus). C. O. Johns and A. J. Finks (*Amer. J. Physiol.*, 1921, **56**, 205-7, 208-12).—VI. The cooked meal plus 0·3% cystine furnished adequate protein for normal rat growth; maintenance, but not growth, took place without the cystine. VII. The same is true, except that omission of cystine only delayed and did not stop growth.—W. D. H.

1808. Estimation of the Alkalinity and of Phosphates in the Ashes of Foods. J. Tillmans and Anna Bohrmann (*Zeit. Nahr.-Genussm.*, 1921, **41**, 1-17).—Should be consulted by those interested in food analysis.—W. D. H. (*J. C. Soc.*).

1809. Feeding Work Horses. W. E. Carroll (Utah Agric. Coll. Exp. Stat., 1920, *Circular* **43**, 18 pp.).—Scientific advice to farmers, who now lose greatly owing to ignorance. The mature work horse needs per 1,000 lbs. live weight 1 to 2 lbs. of digestible true protein, and 7·6 to 18·2 therms of net energy according to the severity of the work;

idle horses require much less. The horse has a wide appetite, though the feed is usually not very varied; his digestive organs do not handle bulky rations economically. Alfalfa is the best hay, but the amount given must be limited; it is best given at night, whereas most of the grain food should be given at noon. They should be watered frequently, but with care if they are hot and tired; sudden changes in ration should be avoided.—W. D. H.

1810. Die Verdaulichkeit und Verwertung der Nährstoffe des Ölpilzes (Endomyces vernalis Ludwig) durch Carnivoren und Herbivoren (Wiederkäuer). W. Völtz, W. Dietrich, and A. Deutschland (*Biochem Zeit.*, 1921, **114,** 111-28).—Feeding experiments with the dried fungus on dogs and sheep show that about 50% is utilised in the dog, and 65% in the sheep.— H. K.

1811. Das Hungern von physiologischen Gesichtspunkt aus. C. Tigerstedt (*Finska Läk. Handlingar*, 1921, **63,** 33-44).—Will appear in German shortly in *Skand. Arch.*—W. D. H.

VITAMINS

1812. Vitamins. J. England (*Discovery*, 1921, **2,** 84-8).—A popular exposition. Nothing new.—W. D. H.

1813. Ration alimentaire et vitamins. A. Desgrez and H. Bierry (*Compt. rend.*, 1921, **172,** 1068-71).—Experiments on rats. If carbohydrate is replaced by an isodynamic equivalent of fat, the nitrogen balance becomes negative from the next day. If the fat of the diet is replaced by an isodynamic equivalent composed mainly of carbohydrate, but to a small extent of albumin, the animals lose weight rapidly, and the balance of nitrogen and phosphorus becomes negative. The loss of nitrogen is rapidly arrested by the supply of 0·022 g. of butter per g. of rat per day. It is concluded that the quantities of the accessory factors A, B, and C, required by the organism vary not only with the alimentary principles, but with the proportions of these principles in the ration; each alimentary principle exercises a functional rôle, in the chemical sense of the word, in the intermediary metabolism of the other two.—J. A. M.

1814. Weitere Beitrag zur Kenntnis von organischen Nahrungsstoffen mit spezifischer Wirkung—V. E. Abderhalden (*Pflüger's Arch.*, 1921, **188,** 60-6).—Dried yeast (0·2 to 0·5 grm. per day) will cure pigeons of beri-beri.—C. L. E.

1815. Distribution of Vitamins in Plants. E. Marion Delf (*S. African J. Sci.*, 1920, **17,** 121-5).—General on the distribution of the 3 vitamins. The production of the fat-soluble factor is related to photosynthesis in the green leaf; the inner white leaves of cabbage do not contain it, though they contain the antiscurvy vitamin.—W. D. H.

1816. Vitamins and Food Preservation. Bidault (*Rev. sci.*, 1921, **59,** 13-5).—The theory that ammonia produced by high temperatures in canning, etc., is responsible for loss of vitamins is held to be untenable.—W. D. H. (*Chem. Abstr.*).

1817. Growth and Reproduction upon Simplified Food Supply.—I. H. C. Sherman, M. E. Rouse, B. Allen, E. Woods (*J. Biol. Chem.*, 1921, **46,** 503-19).—Experiments on rats with such diets as bread, bread and meat, bread and apple, bread and milk (dried and fresh), confirm results of numerous other workers on vitamins.—J. A. H.

1818. Nutritive Value of Yeast in Bread. P. B. Hawk, C. A. Smith, and O. Bergeim (*Amer. J. Physiol.*, 1921, **56,** 33-9).—Experiments on rats. The addition of 5% yeast powder made bread more nutritious. This is attributed to the increase of protein and of vitamin B.—W. D. H.

1819. The Yeast Test for Estimation of Vitamin. W. H. Eddy, H. L. Heft, H. C. Stevenson, and R. Johnson (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 138-40).—The experiments indicate that the test is not specific for vitamin B, but they do not exclude vitamin B as a possible factor in the test.—D. H. de S.

1820. Is Water-Soluble Vitamin Identical with Secretin? G. R. Cowgill (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 148-9).—Extracts of rice polish, wheat embryo, navy bean, and yeast gave negative results on pancreatic secretion.—D. H. de S.

1821. Glyoxalase in Avian Beri-Beri. G. M. Findlay (*Biochem. J.*, 1921, **15**, 104-6).—The glyoxalase content of the liver in pigeons with beri-beri is less than in control pigeons; it is increased by administration of vitamin B. Vitamin B does not act as a co-enzyme of glyoxalase.—J. A. H.

1822. Diet and Rickets. L. Findlay (*Arch. of Pediatrics*, 1921, **37**, 151-62).—Polemical against Mellanby and the Medical Research Council. The author shares Paton's views, scepticism on lack of vitamin as a cause of the disease (Abstract No. 1362, Vol. VI., p. 201).—W. D. H.

1823. Diet and Teeth. May Mellanby (*Brit. J. Dental Sci.*, 1921, **64**, 70-81).—A lecture dealing with vitamins in general and the authoress's experimental work on dogs. The vitamin concerned in tooth development is now labelled vitamin *x*, but whether this is identical with vitamin A (fat soluble) is left open.—W. D. H.

1824. Etiology of Rickets. Bessie T. Strongman and H. I. Bowditch (*Boston Med. and Surg. J.*, 1921, **184**, 443-6).—Rickets is becoming alarmingly frequent in the unhygienic quarters of Boston. Italians especially are affected; Jews and Poles, equally unsanitary, escape. The difference is diet. Italians live mainly on macaroni (American macaroni and bread are poor in vitamin) served in oil (either olive oil or its American cottonseed substitute), also vitamin free; meat, eggs, fish, and fresh vegetables are too dear; milk they do not like.—W. D. H.

1825. The Effect on Kittens of a Diet Deficient in Animal Fat. (1) H. M. M. Mackay (*Biochem. J.*, 1921, **15**, 19-27). (2) F. M. Tozer (*ibid.*, 28-9).—(1) Kittens resemble rats and guinea-pigs in reaction to diet deficient in vitamin A. They are probably more reactive than young rats to a partial deficiency of this substance. (2) The abnormalities at the costo-chondral junction in the experimental kittens in (1) do not resemble those of rickets, but correspond with the changes seen in guinea-pigs on diets deficient in vitamin A.—J. A. H.

1826. Growth of Guinea-Pigs on Various Diets. E. M. Hume (*Biochem. J.*, 1921, **15**, 30-48).—Growth in guinea-pigs takes place on a diet of oats, bran, and water, plus green cabbage (raw or steamed), green cabbage juice, hay and milk (raw, heated, or dried), when orange juice was added if the antiscorbutic value is low; growth is proportional to the ration given. Raw white cabbage, white cabbage juice, swede juice, orange juice, onion or germinated peas produce little or no growth. The growth-promoting factor concerned is probably vitamin A. Guinea-pigs are suitable for testing vitamin A content of non-fatty foodstuffs.—J. A. H.

1827. Antiscorbutic Potency of Milk Powders. E. B. Hart, H. Steenbock, and N. R. Ellis (*J. Biol. Chem.*, 1921, **46**, 309-18).—The antiscorbutic properties of milk powders vary with the diet of the animals producing the milk, and with the method of desiccation.—H. E. R.

1828. Some Observations on the Stability of the Antiscorbutic Vitamin and its Behaviour to Various Treatments. N. R. Ellis, H. Steenbock, and E. B. Hart (*J. Biol. Chem.*, 1921, **46**, 367-80).—Desiccation, fermentation, and oxidation destroy the antiscorbutic substance; it is removed by blood charcoal, and by filtration through a Chamberland filter.—H. E. R.

1829. Antiscorbutic Properties of Japanese Foods. T. Koga (*Bull. Naval Med. Assoc.*, Tokyo, 1920; *J. Amer. Med. Assoc.*, **75**, 1805).—Experiments on guinea-pigs. Bean cellulose causes scurvy. Pickled radish, pickled plums, bean paste, salt pork, and salted salmon did not protect, but cabbage and red beans, especially if sprouting, did. —W. D. H. (*Chem. Abstr.*).

1830. Antiscorbutic Doses of Citrus Fruit Juices. A. J. Davey (*Biochem. J.*, 1921, **15,** 83-103).—The minimum daily doses required are, for lemon, orange, and lime juices, 1·5, 1·5, and 5·0 c.c. respectively. Preservation of the antiscorbutic property of orange and lemon juice by potassium metabisulphate is satisfactory at 0°, and uncertain at room temperature. Preservation by rind oil of lemon juice is satisfactory at 0°; of both at room temperature. The juices are active after 2 years. Preservation at 37° has not been effected. Boiling is suggested.—J. A. H.

1831. Antiscorbutic Value of Dried Milk. H. Jephcott and A. L. Bacharach (*Biochem. J.*, 1921, **15,** 129-39).—Summer and winter milk dried by a roller process have antiscorbutic values equal to raw milk. Neutralised milk similarly dried has a lower value. Spray process dried milk is very deficient; 26 c.c. reconstituted milk per 100 gms. weight suffice to protect the guinea-pig against scurvy.—J. A. H.

1832. Antiscorbutic Value of Full Cream Sweetened Condensed Milk by Experiments on Monkeys. E. M. Hume (*Biochem. J.*, 1921, **15,** 163-6).—Little or no loss of antiscorbutic property or of vitamin A is demonstrated. A possible danger in the use of such milk for infant feeding is mentioned.—J. A. H.

1833. The Antiscorbutic Property of Raw, Dried, and Cooked Apples and Bananas. M. H. Givens, H. B. McClugage, and E. G. van Horne (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 140-1).—Cooking at 100° C. for 15 mins. appears to destroy the antiscorbutic property of the raw fruit. Apples dried at 55° to 60° C. showed some antiscorbutic potency, bananas similarly treated did not.—D. H. de S.

1834. The Effect of Heat and Age upon the Antiscorbutic Vitamin in Tomatoes. M. H. Givens and H. B. McClugage (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 164).—Fresh raw tomatoes, fresh raw tomatoes heated for 1 hour at 100° C., dried tomatoes heated for 15 mins. at 100° C., and canned tomatoes, whether cooked or not, protected guinea-pigs against scurvy when given daily.—D. H. de S.

1835. The Effect of Oxidation on Antiscorbutic Vitamin. A. F. Hess and L. J. Unger (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 143).—The antiscorbutic vitamin of milk is destroyed by the action of hydrogen peroxide. Orange juice subjected to oxygen for a short period loses some of its antiscorbutic potency.—D. H. de S.

1836. Similarity of Effects produced by Absence of Vitamins and by Exposure to X Rays. W. Cramer, A. H. Drew, and J. C. Mottram (*Lancet*, 1921, i., 963-4).—The general effects of avitaminosis are like those of chronic starvation; the authors generalise by the statement that vitamins are necessary for the life of the animal as a whole, but not necessarily or probably for the life of its individual cells. In support of this view they mention, the adrenal, which in avitaminosis enlarges; its cells overgrow in spite of the absence of vitamins. (The adrenals hypertrophy also in starvation. Would the authors argue from this that no food of any sort is necessary for the life of the individual cells ?—W. D. H.) One tissue specially is always affected—viz., lymphoid tissue (in spleen, thymus, lymph glands, Peyer's patches, blood lymphocytes, etc., in rats and mice), in which the number of cells is greatly reduced. Exposure to X rays and radium produces exactly the same effect. Two very dissimilar causes thus lead to inanition, and in both the lymphoid tissue suffers most—a fact which points to its importance for life, and which the authors are to follow up. A new and useful field. (A method used by the authors for expressing their results is to speak of avitamin rats This short cut is apt to lead to confusion. An "Avitamin rat" is presumably a rat deprived of vitamin. It might equally well (if written: "A vitamin rat") be a rat fed on vitamin A.)—W. D. H.

1837. Pellagra in Patients apparently Receiving an Ample Diet. W. F. Tanner and G. L. Echols (*J. Amer. Med. Assoc.*, 1921, **76,** 1337-8).—Pellagra not infrequently develops in patients under treatment for other conditions. This is often because

although the patient is provided with an adequate diet, not all of the constituents are consumed.—C. L. E.

METABOLISM

1838. Stem Length and Trunk Length. H. Gray and H. F. Root (*Boston Med. and Surg. J.*, 1921, **184**, 439-43).—A description and discussion of various indices proposed by v. Pirquet, Dreyer, Bornhardt, Miles, and others for obtaining statistical data in the estimation of efficiency, metabolism, and the like.—W. D. H.

1839. Metabolism of Europeans in the Tropics. W. Caspari (*Die Umschau*, 1921, **25**, 77-9).—The basal metabolism of the same men in Berlin and tropical Africa was the same, but the metabolism of the men at work was 10% less in Africa.—W. D. H. (*Chem. Abstr.*).

1840. Le métabolisme de l'homme tropical. C. Eijkman (*J. de physiol. et de pathol. gén.*, 1921, **19**, 33-5).—The basal metabolism of inhabitants of warm climates is not markedly different from that of temperate regions. Temperature regulation in the tropics is only to a minute degree of a chemical nature, but chiefly brought about by radiation and evaporation of water.—W. M. B.

1841. Influence des saisons sur la glycogénie. F. Maignon (*J. de physiol. et de pathol. gén.*, 1921, **19**, 13-32).—In addition to the effect of temperature on the glycogen of the muscles, important in cold-blooded animals, there is in guinea-pigs a further seasonal action excited partly on the genital glands, partly on the tissues in general. It is suggested that there may be special radiations from the sun or other stars, arriving chiefly in spring and autumn.—W. M. B.

1842. The Cost of Muscular Work measured by Output of CO_2. A. D. Waller and G. de Decker (*Brit. Med. J.*, 1921, i., 669-71).—The energy output of colliers is 96 calories per hour per square metre of blood surface, that of shoemakers is 32. The relation of their energy output to that of other workers measured during the last 2 years is shown in a table and graphs.—D. H. de S.

1843. The Physiological Cost of Muscular Work. L. Hill and J. A. C. Campbell (*Brit. Med. J.*, 1921, i., 733-4).—The authors criticise the method used by Waller and de Decker (see Abstract No. 1385, Vol. VI., p. 204), which they have compared with the Douglas bag method. They consider that a source of error is the short duration of the period for obtaining the sample of expired air, for they find that the volume of CO_2 expired while at rest or at work varies greatly during consecutive half-minute periods, and also that the CO_2 exhalation per sec. obtained in a 30-sec. sample is rarely similar to that obtained per sec. during a 4-min. period. They also indicate the importance of the influence of food, and consider that this has not been sufficiently emphasised by Waller and de Decker.—D. H. de S.

1844. Energy Requirements of Girls from 12 to 17. F. G. Benedict and Mary F. Hendry (*Boston Med. and Surg. J.*, 1921, **184**, 217-22, 257-62, 282-6, 297-300, 329-34).—Detailed observations on squads of girl scouts, carried out with the authors' customary methods and thoroughness. Observations on pulse, sweat, respiratory quotient, basal metabolism, and heat production, etc., are set out at length. The average basal heat production der diem is 1,250 cals. per individual, irrespective of age. Metabolism can be predicted with fair accuracy by a formula. Puberty or the prepuberant stage, had no clear effect.—W. D. H.

1845. Malnutrition in Children. T. Clark (*Publ. Health Rep.*, U.S. Publ. Health Service, 1921, **36**, 923-30).—Causes, diagnosis, treatment, and feeding are the main heads. Statistics as to weights, heights, etc., are given in tables.—W. D. H.

1846. Influence of Food on Metabolism. S. Corinaldesi (*Riforma medica*, 1920, **36**, 925).—By the Bang micro-methods it is possible to follow the changes in the intermediate and external metabolism from hour to hour. The author thus established a curve of metabolic disintegration and catabolic elimination of the N substances introduced in the food. Minute details of 4 cases are recorded, and the conclusion is emphasised that as the urea content of the blood and urine fluctuates within such a wide range in normal conditions during the hours of digestion, the clinical record of the intermediate and external metabolism should be taken fasting, and at least 7 or 8 hours. after a meal.—W. D. H. (*Chem. Abstr.*).

1847. The Cholesterol Cycle. A. Chauffard, G. Laroche, and A. Grigaut (*Ann. de méd.*, 1920, **8**).—These factors are regarded as controlling cholesterol metabolism: (1) The food supply is only a temporary one; (2) the hepatic activity by which it is eliminated; and (3) most important the adrenal cortex, its seat not only of storage, but of formation.—W. D. H. (*Lancet*).

1848. Diet and Sex as Factors in the Creatinuria of Man. Genevieve Stearns and H. B. Lewis (*Amer. J. Physiol.*, 1921, **56**, 60-71).—The menstrual cycle and high protein diet have no effect. No evidence was found when creatine is given per os that the female has less power to destroy it than the male.—W. D. H.

1849. The Metabolism of the Eunuch. B. E. Read (*J. Biol. Chem.*, 1921, **46**, 281-3). —Creatine is found in the urine in some cases.—H. E. R.

1850. Beiträge zum Nukleinstoffwechselproblem. II. Über die Einwirkung menschlicher Fäces auf Hefenukleinsäure. J. Rother (*Zeit. physiol. Chem.*, 1921, **114**, 149-60).—Yeast nucleic acid is treated with a watery suspension of fæces at 37° C. for 40 to 48 hours. At the end of this time about half the purine compounds originally present have been decomposed. After ingestion of yeast nucleic acid the same decomposition occurs in the large intestine.—H. W. D.

1851. The Law of Probability applied to the Formation of Fats from Carbohydrates. E. J. Witzemann (*J. Phys. Chem.*, 1921, **25**, 55-60).—There are 2 types of hypotheses concerning the mechanism of the formation of fatty acids from carbohydrates: (1) They are built up mainly from short C chains (less than 6); (2) they are built up mainly from chains of 6 C atoms. In organisms most of the fat is formed from the abundant sugars having 6 C atoms. Since natural fats are mainly composed of C_{18} acids, the relations in (2) are statistically true. If (1) is correct, the preponderance of C_{18} acids could only be explained by a sharp break at C_{16} in a physical property significant for synthesis. Such a break is not known. Consequently, the synthesis apparently becomes amenable to the law of probability. A probability diagram constructed on the basis of a rough estimate of the relative occurrence of fatty acids gives the typical form of the probability curve only when the points C_6, C_{12}, C_{24}, and C_{30} are connected. When the physical properties of this series are considered, there is a sufficient change in passing from C_{12} to C_{18} to account for the preponderance of C_{18} acids. The results form an agreement in favour of (2), which is E. Fischer's hypothesis, and constitute a different application to biology of this fundamental law from that known as Quetelet's law of fluctuating variation.—W. D. H. (*Chem. Abstr.*).

1852. Rate of Nitrogen Elimination. W. S. McEllroy and H. O. Pollock (*J. Biol. Chem.*, 1921, **46**, 475-81).—The nitrogen passed at 2-hour intervals for 24 hours, and the urea N and non-protein N of the blood (at 1-hour intervals) were examined in dogs fed on lean meat. The results indicate that the rate of elimination is an index of the rate of digestion and absorption.—W. D. H.

1853. La constante d'Ambard. M. Ide (*Rev. méd. de Louvain*, 1921, 33-41).—Selon l'auteur, les lois de la sécretion de l'urée proposées par Ambard sont inexactes. La

formule d'Ambard n'à guère de valeur, car pratiquement cette formule traduit seulement les variations de l'urée du sang.—E. Z.

1854. Alkapton and Acetone—II. G. Katsch (*Deut. Arch. klin. Med.*, 1920, **134**, 59-68).—Elimination of homogentisic acid ceases, and its place is taken by acetone in course of the hunger period in alcaptonuria. A proof is thus afforded of the absence of a strict dependence of the elimination of homogentisic acid on protein metabolism. Great restriction in the albumin causes a depression in the homogentisic acid eliminated, but the alcaptonuria is not altered in the same manner as in the total absence of albumin. The quotient, homogentisic acid : N, remains normal (about 50) if carbohydrate metabolism is undisturbed and ketonuria is absent. In a further experiment, acidosis was induced by an albumin-fat diet; homogentisic acid was only found in traces, and considerable quantities of acetone substances were immediately observed. On the hypothesis that a molecule of the acid corresponds with a molecule of acetone, the lack of the former is not sufficient to enable it to be regarded as sole source of the latter. It is improbable that, in cases of limitation of carbohydrate, those substances which form alcapton are the only origins of acetone. The author is drawn to the conclusion that the hydration processes of carbohydrate and albumin are related phenomena, thus resembling those of carbohydrate and fat as observed by Embden and Isaak.—W. D. H. (*J. C. Soc.*).

1855. The Heat Regulating Mechanism of the Body. H. G. Barbour (*Physiol. Reviews*, 1921, **1**, 295-326).—A review treated under the following headings: (1) Heat regulation in lower animals; (2) and in man; (3) chemical and physical regulation against cooling; (4) chemical and physical regulation against overheating; (5) nervous control of heat regulation; (6) heat regulation and endocrine glands; (7) fever; (8) pharmacology of heat regulation; (9) heat regulation and carbohydrate metabolism.—J. A. H.

1856. Metabolism in Pellagra : The Urine. M. X. Sullivan, R. E. Stanton, and P. R. Dawson (*Arch. Int. Med.*, 1921, **27**, 387-405).—In the actively pellagrous stage there was a low P_2O_5 excretion, despite a generous diet In 50% of cases there were some kidney changes (casts in urine). Total nitrogen, urea ratio, uric acid, and creatinine, were all low. Ammonia nitrogen and undetermined nitrogen were high.—J. H. B.

SUGAR AND DIABETES

1857. The Sugar of the Blood. J. J. R. Macleod (*Physiol. Reviews*, 1921, **1**, 208-38).—A review. The following aspects are discussed: (1) The manner of existence of sugar in blood; (2) distribution of sugar between plasma and corpuscles; (3) glycolysis in blood; (4) the percentage of sugar in venous blood of man and lower animals; (5) the blood-sugar curve following ingestion of carbohydrate; (6) the relationship between degree of hyperglycæmia and development of glycosuria; (7) the blood-sugar curve and the renal threshold in disease.—J. A. H.

1858. Blood-Sugar Regulation and the Origin of Hyperglycæmia. I. Glycogen Formation and Glycogenolysis. II. Conditions of Action of Liver Diastases. III. Theory. E. Langfeldt (*J. Biol. Chem.*, 1921, **46**, 381-90, 391-402, 403-9).—I. is historical. II. contains experiments showing the effect of H-ion concentration, Cl ions, phosphate ions, adrenaline, and thyroidin on hydrolysis of glycogen by liver diastase. III. suggests that the amount of sugar in the blood is regulated by the amount of glycogenolysis in the liver.—H. E. R.

1859. Glycæmia and Glycosuria. G. Graham (*Lancet*, 1921, i., 951-5, 1003-7, 1059-65).—Goulstonian lectures. The first deals with blood-sugar, its estimation, fate, etc., the second with the types of diabetes, and the third with treatment. The subject is amply treated, and copious references are given.—W. D. H.

1860. Diabetes. Ser. II. Internal Pancreatic Function in Relation to Body Mass and Metabolism. IV. Pancreatic Cachexia. F. M. Allen (*Amer. J. Med. Sciences*, 1921, **161**, 350-64).—Descriptions are given of symptoms (asthenia, gangrene, etc.) which accentuate the resemblances between clinical and experimental (partial pancreatectomy) diabetes. The details will interest specialists.—W. D. H.

1861. Ein Beitrag zum Stoffwechsel der vasculären Hypertonie. K. Hitzenberger and M. Richter-Quittner (*Wien. Arch. f. inn. Med.*, 1921, **11**, 189-216).—During primary and secondary vascular hypertonia, hyperglycæmia was observed, which is independent of alimentary factors. It is produced by an increased production of glucose. In diabetics the hyperglycæmia is greater than the corresponding glycosuria. Hyperuricæmia is also found in many cases of vascular hypertonia, which differs from that in gout, in that no retention of the uric acid occurs; excretion of the uric acid increases in a parallel way. The author thinks that the whole syndrome is caused by an increase of adrenaline secretion.—H. W.

1862. Über die Wirkung intravenösverabreichter Traubenzucker- und Gummiarabicum Lösungen auf die Diurese. K. Cori (*Wien. klin. Woch.*, 1921, **34**, 169-71).—Intravenous injections of hypertonic glucose solutions cause intense diuresis in dogs. A great excretion of Cl also occurs. If the excretion of the Cl is lowered by a diet nearly devoid of salts, the diuretic effect is smaller. Increased output of the chlorides from the tissues into the blood can be proved also after 24 hours. The absorption and excretion of salts (nitrates) given per os is accelerated by the dextrose injection. In men dextrose injection has no diuretic effect, because the Cl is bound more firmly in the tissues. Intravenous injections of 7% solutions of gum-arabic diminishes the excretion of sugar and of the quantity of the urine in many cases of diabetes. The same solution causes in dogs a decrease of iodine excretion and a slight diuresis, but does not produce a flushing-out of the Cl.—H. W.

1863. Source of Blood Diastases. L. H. Davis and E. L. Ross (*Amer. J. Physiol.*, 1921, **56**, 22-8).—The diastatic power of the serum was determined in dogs which were normal, and which had had their pancreas removed partially or completely. All the dogs were given chloroform or ether before the blood was collected. It is anæsthesia that produces changes in the blood diastase, and the question arose whether the liver or pancreas is its source. The latter organ is regarded as the main source of the starch-splitting enzyme in the blood, for its removal decreased the enzyme. Ether had no effect on it, either in normal or pancreatectomised dogs. Chloroform (especially after fasting) caused a marked fall in normal animals, but little or no effect in those without a pancreas.—W. D. H.

1864. A propos de l'emploi du fluorure ou du citrate de sodium comme agents anticoagulants dans l'opération du dosage du sucre du sang. R. Clogne and A. Richaud (*Bull. de la soc. de chimie biol.*, 1921, **3**, 66-8).—The blood-sugar, when NaF is used as anticoagulant, undergoes a glycolysis of about 10% in the first 24 hours, but beyond that time remains constant up to 96 hours. In the case of sodium citrate glycolysis proceeds at a quick rate, so that only a half or third of the blood-sugar is left in the first 24 hours, and none in second 24 hours.—G. V. A.

1865. Formation of Colloidal Copper in Urine containing Sugar. L. de Jager (*Ned. T. v. Geneesk.*, 1921, **65**, 2006).—The author has found a reaction in diabetic urine, in which colloidal copper is formed; the colloid, which is reversible, is ruby red. Zsigmondy describes an analogous copper hydrosol with the same spectrum.—R. B.

1866. Estimation of Blood-Sugar. E. Ponder and L. Howie (*Biochem. J.*, 1921, **15**, 171-4).—Essentially the method of Folin and Wu applied to 0·2 c.c. blood. Details are given.—J. A. H.

1867. Difference Value of the Blood. P. J. Cammidge, J. A. C. Forsyth, and H. A. H. Howard (*Lancet*, 1921, i., 1017-20).—This cryptic expression is not defined, but so far as one can make out it means the difference between total carbohydrate and glucose. It is attributed to the presence in the blood of a dextrin-like substance partly absorbed from the intestine, but mainly derived from the incomplete hydrolysis of hepatic glycogen. Differences are detailed between the curve of the "difference value" in pancreatic and hepatic diseases.—W. D. H.

1868. Experimentelle Blutzuckeruntersuchungen bei Kindern. A. Mertz and E. Rominger (*Arch. f. Kinderheilk.*, 1921, **69,** 81-106).—The amount of blood-sugar 4 hours after the last meal is 0·081% in healthy sucklings. The importance of the state of imbibition of the intestinal mucous membrane for the absorption of glucose is proved by the experimental inhibition of this imbibition by means of tannin, for in these cases the blood-sugar is considerably diminished. The blood-sugar curve was determined in experiments on healthy sucklings of various ages after doses of 30 g. glucose. These curves show considerable individual differences, and sucklings with exudative diathesis show higher blood-sugar values. In fever the fasting value, but not the general curve, is increased. In liver disease hyperglycæmia is greater, and lasts longer.—H. W.

KIDNEYS AND URINE

1869. Peristaltic Movements of the Renal Pelvis. W. F. Wasfink (*Ned. T. v. Geneesk.*, 1921, **65,** 29).—In a freshly removed hydronephritic kidney rhythmic movements were observed (±4 per min.). The contractions started in the calices, and passed on to the pelvis.—R. B.

1870. Indikan bei Nierenkrankheiten. E. Becher (*Deutsch. med. Woch.*, 1921, **47,** 42-3.)—The indican of the blood runs parallel with the residual nitrogen in renal insufficiency.—W. D. H.

1871. Tests for Alkaline Carbonates in Urine. C. Mitchell (*Med. Rec.*, New York, 1921, **99,** 516-9).—The addition of 1% mercurous nitrate gives a dark precipitate (colour ?), and Nessler's reagent a red precipitate, due to Am_2CO_3. If the second test is negative and the first positive, the carbonate must be that of Na. Drugs, such as iodides, may lead to erroneous conclusions.—W. D. H.

1872. Estimation of Inorganic Phosphate in Urine by Alkalimetric Titration. C. H. Fiske (*J. Biol. Chem.*, 1921, **46,** 285-93).—The phosphates are precipitated by magnesium citrate, and the amount of acid necessary to neutralise the precipitate is measured.—H. E. R.

1873. Eine neue Eiweissreaktion. A. M. Hibma (*Deutsch. med. Woch.*, 1921, **47,** 272).—The urine is acidified with acetic acid, and an aniline dye ("Tinte") added. Protein, if present, is precipitated; the reaction is a sensitive one. (Tinte is ink, but apparently "Tinte" is a special kind.)—W. D. H.

1874. Nachweis von Albumosen und Peptonen im Harn. E. H. Fittipaldi (*Deutsch. med. Woch.*, 1921, **47,** 42).—Gnezda's nickel biuret test (*Proc. Roy. Soc.*, 1889, **47,** 202-10) is recommended.—W. D. H.

1875. Nachweis von Azeton im Harn. (1) J. Koopman. (2) H. Citron (*Deutsch. med. Woch.*, 1921, **47,** 244-5; compare Abstract No. 958, Vol. VI., p. 145).—Polemics. —W. D. H.

1876. The Routine Estimation of Creatinine and Acetone in Urine. H. J. Goeckel (*J. Lab. and Clin. Med.*, 1921, **6,** 338).—The method is based upon the sodium nitroprusside test.—D. H. de S.

1877. Die Tageskurve der Stalagmone. S. Zandrén (*Biochem. Zeit.*, 1921, **114,** 211-20).—An attempt to find what factors influence the urinary content of stalagmones

(substances which depress the surface tension) in a normal person. The stalagmometric measurements were made on urines brought to the same density and P_H.—H. K.

1878. Test for Formaldehyde in Urine. E. Pittarelli (*Rif. med.*, 1920, **36,** 936).—To 25 c.c. urine add 10 drops of 1% phenyl hydrazine solution and boil. Set aside for a few minutes, add 5 drops of the developer metol (methyl-*p*-amino-phenol) and 3 drops of 25% NaOH. In the presence of formaldehyde or hexamethylene tetramine the fluid turns scarlet; on the addition of saturated solution of $MgSO_4$ it turns blue.—W. D. H. (*Chem. Abstr.*).

ENDOCRINE SYSTEM

1879. The Services rendered to the Human Organism by the Sympathetic and Parasympathetic Systems, including both Nerves and Glands of Internal Secretion. F. M. Pottenger (*Endocrin.*, 1921, **5,** 205-15).—The endocrine glands may be divided into those which act with the sympathetics (adrenals, thyroid, pituitary), and those which act with the parasympathetics (parathyroids, pancreas, duodenum). The sympathetic nerves and the sympatheticotropic glands aid in the defence of the organism against enemies from without. The parasympathetic nerves and parasympathicotropic glands provide the body with an appetite and the secretions for the digestion of the food, and motor power to the alimentary tube. The paper is a striking illustration of the tendency to excessive theorising on matters connected with internal secretion. The author does not state that he has performed any experiments. The communication shows, too, how far nomenclature is outstripping our actual information. Parasympathicotropic !—S. V.

1880. Chemical Influence of Internal Secretions. E. C. Kendall (*Surg., Gynecol., and Obstet.*, 1921, **32,** 205-9).—General on adrenaline, pituitrin, and especially thyroxin, as one would expect from the author's name.—W. D. H.

1881. The Thyroid Apparatus. I. The Stability of the Nervous System as a Factor in the Resistance of the Albino Rat to the Loss of the Parathyroid Secretion. F. S. Hammett (*Amer. J. Physiol.*, 1921, **56,** 196-204).—Complete thyroidectomy gave 79% mortality by parathyroid tetany in rats which had not been petted, and were wild; only 13% in those tamed by petting. It is suggested that the production of ammonia or guanidine by muscle tone is much less in the latter group.—W. M. B.

1882. Distribution of Iodine between Cells and Colloid in the Thyroid. III. The Effect of Stimulation of the Vago-Sympathetic Nerve on the Dog's Thyroid Gland. H. B. v. Dyke (*Amer. J. Physiol.*, 1921, **56,** 168-81).—No change occurred in the distribution of iodine. There was no reduction in the content of iodine in the stimulated lobe.—W. M. B.

1883. Über die Entdeckung des wirksames Bestandteiles der Schilddrüse. E. M. P. Widmark (*Sven. Lärkartidn.*, Stockholm, 1920, **17,** 241-6).—The author gives an account of Kendall's work on "thyroxin," and suggests that, since this substance is chemically related to tryptophan, a diet deficient in tryptophan should be tried in cases of hyperthyroidism.—S. V. (*Endocrin.*).

1884. Physiological Hyperthyroidism. H. Brooks (*Endocrin.*, 1921, **5,** 177-89).—Periods of great emotional output are accompanied by enlargement of the thyroid. There may be tremor and exophthalmos. This tendency is marked during pregnancy and menstruation, but is shown also in young men. Such cases, if improperly treated, may develop into cases of Graves' disease. The treatment should consist in social, medical, and mental readjustments. Surgical or other radical treatment is not called for.—S. V.

1885. Hyperplasie und Hypersecretion der Schilddrüse bei Kindern und Jugendlichen. E. Schlesinger (*Zeit. f. Kinderheilk.*, 1920, **27,** 207-30).—In various times of growth, especially in countries where goitre is frequent, the thyroid manifests periods of hyperplasia (1) soon after birth; (2) at the age of 6 to 7 (females), and 9 (males); and (3) at puberty. This leads to acceleration of growth and keenness of mind, but, if intense, produces the usual effects of hyperthyroidism.—H. W.

1886. Das Gehirn und die Schilddrüsenfunction. C. Ceni (*Arch. f. Entwickl. Mechan.*, 1921, **47,** 587-616).—In the chelonians (*Testudo græca* and *T. marginata*), no connection exists between the cerebrum and the function of the thyroid (experiments with decerebrated animals.) On the other hand, cerebrum and thyroid are intimately connected in birds (fowls and pigeons). Disturbance of the cerebrum influences the gland in different ways, according to the time which the animal has lived afterwards, and to the kind of the damage. The histological changes are described. Hypertrophy of the thyroid was not constantly, but often, observed in fowls. No distinct relation exists in fowls between the state of atrophy or hypertrophy of the thyroid gland and the general evolution of the body and of the sexual organs. In dogs, wounding of the cerebrum or of parts of the surface of one hemisphere causes similar phenomena as in birds (diffuse colloid hypertrophy, and later parenchymatous hypertrophy). In vertebrates, higher thyroid centres exist, therefore, in the cerebrum, with an inhibitory trophic dynamic effect.—H. W.

1887. 1,146 Goitres in 1,783 Persons. S. Levin (*Arch. Int. Med.*, 1921, **27,** 421-33). —A study of the thyroid gland in the Great Lakes goitre belt; 682 were simple goitres (enlarged gland with no symptoms), 420 were neoplastic, and 44 were colloid. The high percentage at all ages of persons with goitre is due to simple goitre up to the age of 35, and to new growths after that age. The incidence was independent of the water supply (*i.e.*, spring water or Lake Superior water).—J. H. B.

1888. Parathyreoideastudien. I. Zur normalen Anatomie der Glandula parathyreoidea. II. Über Tumoren und hyperplastische Zustände der Nebenschilddrüsen. H. Bergstrand (*Acta med. Scand.*, 1920, **52,** 791-855; 1921, **54,** 539-600).—I. The embryology, anatomy, histology, and cytology in detail, with a valuable bibliography. II. Clinical cases, and a consideration of the relation between the parathyroids and other diseases, such as tetany, eclampsia, epilepsy, osteomalacia, etc.—C. L. E.

1889. Quelques idées nouvelles sur les fonctions du thymus. A. Dustin (*Bull. soc. sci. méd. et nat. Bruxelles*, 1921, 27-9).—L'élément fonctionnel essentiel du thymus est la petite cellule thymique ou thymocyte. Cette cellule dérive d'une cellule souche d'origine épithéliale par le mécanisme de la mitose élassotique. Les corps de Hassall ne représentent pas les agents d'une sécrétion endocrine. Le thymus agit en fixant ou en libérant des nucléoprotéides selon les besoins de l'organisme. Cette fonction peur être influencée par d'autres glandes endocrines, et notamment par le corps thyroide.—E. Z.

1890. Die Vereinigung von Interrenal und Adrenalsystem zur Gesamtnebenniere. Die Nebenniere als einheitlichfunktionieren des Organ. K. Löwenthal (*Berl. klin. Woch.*, 1920, **57,** 807-11).—The author revives the theory that a "pre-adrenaline" is formed in the cortex, that it passes by the capillaries into the medulla, and is transformed there into adrenaline. The function of the cortex is to store cholesterol, to produce a local immunity, and to protect in this way the medulla from infection.—S. V. (*Endocrin.*).

1891. Effets de l'ablation des surrénales sur les contractions automatiques du duodénum isolé du lapin. F. de Mira and J. Fontes (*J. de physiol. et de pathol. gén.*, 1921, **19,** 1-12).—The spontaneous contractions of the excised duodenum of rabbits, from which the suprarenal capsules have been removed, are very small or absent. The

effect is present even in an hour. Controls show that it is not due to anæsthetic or shock. The inhibitory reaction to adrenaline is apparently unaffected. Thus, adrenaline itself was unable to supply the deficiency of the suprarenal body as a whole. On the other hand, suprarenal extracts, injected after removal of the suprarenal bodies, prevent the appearance of inactivity in the duodenum excised 15 mins. after the injection. It is suggested that it is the cortex that is responsible.—W. M. B.

1892. The Vasomotor Response in Anæmia of the Medulla Oblongata. C. S. Winkin (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 155-8).—Anæmia was produced by clamping off the arterial circulation of the head. The vasomotor response was found to depend almost entirely upon the constrictor fibres of the splanchnic nerves, the impulses passing down from the medulla. From experiments in which the adrenal glands were tied off, it is concluded that adrenaline not only makes possible the maintenance of the effect initiated by the splanchnic fibres, but also is itself apparently necessary for the maintenance of vasomotor tone. There is a complete dependence on the functional conductivity in the brain stem of both the initiation of the vasomotor effect by the splanchnics, and the increased secretion of adrenaline through which it is maintained.—D. H. de S.

1893. The White Adrenal Line. W. E. Kay and S. Brock (*Amer. J. Med. Sciences*, 1921, **161,** 555-61).—This is the blanching of the skin following light stroking by a blunt object. It is a local vasomotor reflex, and has no direct relationship to adrenal activity, as Sergent supposed.—W. D. H.

1894. Über Adrenalinglykämie. A. Bornstein (*Biochem. Zeit.*, 1921, **114,** 157-64).—Subcutaneous administration of adrenaline to the human subject causes increased pulmonary ventilation, with a fall in the alveolar tension of CO_2. The respiratory quotient rises, but this is not necessarily due to increased combustion of carbohydrates.—H. K.

1895. Duration of Constriction of Bloodvessels by Adrenaline. S. J. Meltzer and J. Auer (*J. Pharm. Expt. Ther.*, 1921, **17,** 177-96).—Whereas an intravenous injection of adrenaline only raises the blood-pressure for a period of minutes, a subcutaneous injection of this substance into the ears of rabbits causes intense constriction for a long period—3 to 8 hours. The further the injection is away from the central artery of the ear, the longer is the latent period. All the vessels of the ear, including the veins, may be constricted. The injected ear becomes cold, hangs down, and is infrequently moved. When the constriction passes off there is a tendency to vaso-dilatation.—E. M.

1896. Drugs and the Output of Adrenaline. VII. Physostigmine. G. N. Stewart and J. M. Rogoff (*J. Pharm. Expt. Ther.*, 1921, **17,** 227-48).—By means of the well-known technique adopted by these workers, it was found that physostigmine injected either intravenously or subcutaneously into cats increased the output of adrenaline from the adrenal glands from 10 to 15 times. Immediately after the injection there was a transient diminution in output. After section of the splanchnic and other nerves going to the adrenals, there was no evidence that physostigmine caused this increased output of adrenaline.—E. M.

1897. (1) Adrenaline Output in Adrenal Blood obtained without Opening the Abdomen. (2) Post-Operative Depletion of Adrenaline Store in Adrenals. G. N. Stewart and J. M. Rogoff (*Amer. J. Physiol.*, 1921, **56,** 213-9, 220-9).—(1) It is possible to prepare the left lumbo-adrenal vein in dogs through a lumbar incision without opening the peritoneum; the rate of adrenaline output is the same as when the abdomen is opened. (2) This is the exception rather than the rule in rabbits and cats, and is in the main the consequence of the anæsthetic. Thyroparathyroidectomy increases the weight of the adrenals in rabbits; the store of adrenaline increases with the weight of the adrenals.—W. D. H.

1898. Adrenaline Sensitiveness and Hyperthyroidism. F. W. Peabody, C. G. Sturgis, E. M. Tompkins, and J. T. Wearn (*Amer. J. Med. Sciences*, 1921, **161,** 508-16).—Sensitiveness to adrenaline given intramuscularly varies greatly even in highly nervous people, where it is generally high. It has no specific relationship to hyperthyroidism.—W. D. H.

1899. Über die Wirksamkeit peroraler Adrenalinanwendung bei gleichzeitiger Zufuhr von Traubenzucker. H. Beumer (*Berlin. klin. Woch.*, 1921, **58,** 206-7).—It is generally known that if adrenaline is given by the stomach, it produces no general effects on the vascular and nervous systems, nor in the blood-sugar, as it is rendered inactive by oxidation in the alimentary canal. Kestner, however, has recently stated (see Löwe, *Ther. Halbmonatshefte*, 1920, Heft 15) that the negative effect can be neutralised by giving glucose at the same time. In what way he arrived at this conclusion passes the understanding of the present author; he has been entirely unable to confirm it.—W. D. H.

1900. Reversal of Depressor Action of Small Doses of Adrenaline. J. B. Collip (*Amer. J. Physiol.*, 1921, **55,** 450-4).—The depressor effect of small doses of adrenaline may be converted into a pressor one by increasing the ether or chloroform narcosis, or by intravenous administration of sodium carbonate. The pressor effect of a moderate dose may be increased by sodium carbonate, and decreased by acid sodium phosphate. Atropine does not prevent these reactions, nor the antagonism of small doses of adrenaline by tissue extracts.—W. M. B.

1901. Die Blutdruckveränderung nach Adrenalininjektionen als Gradmesser für den Tonus in autonomen und sympathischen Nervensystem. G. Lehmann (*Deutsch. med. Woch.*, 1921, **47,** 41-2).—Observations on numerous patients who had adrenaline injections support on the whole Dresel's views (Abstract No. 2843, Vol. IV., p. 460) on the value of the method for ascertaining the tone of the parts of the nervous system referred to.—W. D. H.

1902. Hypersensibilité à l'adrénaline des animaux chloralosés. E. Bardier and A. Stillmunkés (*Compt. rend. soc. de biol.*, 1921, **84,** 766-7).—The intravenous minimal lethal dose of adrenaline for rabbits is 0·33 mg. per kilo. After chloral 0·05 mg. per kilo will kill, causing death with pulmonary œdema.—J. H. B.

1903. Die Wirkung des Papaverins auf die Adrenalinblutdrucksteigerung beim Menschen. K. Csepai (*Wiener klin. Woch.*, 1921, **34,** 186).—Contrary to Pal's experiments on animals, papaverine does not neutralise the rise of blood-pressure produced by adrenaline injections, but usually increases it.—H. W,

1904. Hypophysis Tumours in Domestic Animals. H. A. Vermeulen (*Endocrin.*, 1921, **5,** 174-6).—Pathological enlargements of the pituitary can arise from remains of the hypophysis vesicle, from the ependyma of the infundibular canal, and by hyperplasia of the glandular portion. The author gives examples of tumours arising in these different ways in domestic animals.—S. V.

1905. Diabetes Insipidus as a Hypopituitary Syndrome. G. Marañon (*Endocrin.*, 1921, **5,** 159-73).—The author is firmly convinced that diabetes insipidus is, at least in a large majority of cases, a consequence of an insufficiency of the posterior lobe of the pituitary. He states that "all clinicians, practically without exception, are agreed to this interpretation of the problem"; 32 cases are quoted in support of this view. Great stress is laid on enlargement of the sella turcica (although the author insists that in nearly all cases the lesions were not tumours, but sclerosis, atrophy, hæmorrhage, etc.), and the beneficial effects of pituitary substance. It is alleged that pituitrin is only able to act on pathological polyuria by reducing it to normal, but without reducing it below this limit. Marañon thinks that the internal secretion of the posterior lobe of the pituitary exercises physiologically a controlling action on the elimination of water through the

renal filter, and that, through the disturbance of this controlling mechanism, diabetes insipidus is produced. With the posterior lobe the author reckons also the pars intermedia. He insists on the importance of the emotions in the pathogeny of the disease. —S. V.

REPRODUCTIVE SYSTEM

1906. Über die physikalische und chemische Beschaffenheit des Pferdespermas mit besonderer Berücksichtigung der Physiologie der Spermatozoen. J. Yamane (*J. Coll. Agric., Hokkaido Imp. Univ.*, 1921, **9,** 161-236).—An exhaustive account of the spermatic fluid and spermatozoa of the horse which must be consulted in the original; the title indicates the field covered.—R. K. S. L.

1907. La forme reptilienne du spermatozoïde du Pangolin et sa signification. R. Anthony and Ch. Champny (*Compt. rend.*, 1921, **172,** 1134-7).—The spermatozoon of Pangolin differs from that of all other mammals, except Echidna, in being of the reptilian type, with an elongated, slightly twisted head. The significance of this is discussed, and it is concluded that in the case of the ant-eater the form of the spermatozoon has not varied, as in other mammals, with the progress of evolution.—J. A. M.

1908. Zur Histochemie der Spermatozoen. IV. Über die chemische Zusammensetzung der Spermatozoen des Maifisches. H. Steudel (*Zeit. physiol. Chem.*, 1921, **114,** 161-6).—All the phosphorus present in the heads of the spermatozoa is organically combined in the form of thymus nucleic acid.—H. W. D.

1909. Observations on Two Testes Nine Months after Vasectomy. H. Wheelon (*Endocrin.*, 1921, **5,** 307-8).—Two testes removed 9 months following vasectomy showed the presence of spermatic tissue, spermatids, an increased interstitial tissue, and complete occlusion of the vas. The dogs from which these testes were removed gained slightly in weight, but gave almost identical vasomotor responses to nicotine injections as before the operation. The conclusion is that either complete degeneration of the spermatic tissue does not occur after vasectomy, or that degeneration does occur, followed by regeneration within a period of 9 months.—W. D. H.

1910. Über das Minimum der Hodensubstanz, das für die normale Gestaltung der Geschlectsmerkmale ausreichend ist. A. Lipschütz, B. Ottow, and K. Wagner (*Pflüger's Arch.*, 1921, **188,** 76-86). **Sur les conséquences de la castration partielle.** A. Lipschütz and B. Ottow (*Compt. rend. soc. biol.*, 1920, **83,** 1340).—In young guinea-pigs the minimum is 1% of the weight of the 2 normal testes, but partial or delayed masculation is seen when only 0·5% is left. The testicular remnant never showed mass hypertrophy, but the interstitial cells hypertrophied and proliferated to such an extent that the authors estimate that the interstitial tissue in an adequate remnant is not inferior to that in the 2 normal testicles. If this tissue is regarded as the endocrine tissue of the testis, then it is clear that the normal amount of internal secretion is produced by the remnant, whereas if the seminiferous cells are held responsible, the speedy degeneration of these would mean that about 0·7% of the secretion is as efficient as the whole; if the Sertoli cells are viewed as the secreting cells, then the changes in the remnant are such that these could only produce from $\frac{1}{6}$ to $\frac{1}{18}$ of the normal secretion.—C. L. E.

1911. Die Steinachschen Operation. Levy-Lenz and P. Schmidt (*Deutsch. med. Woch.*, 1921, **47,** 327-8).—This is an operation performed originally by Steinach on animals, and now done on men with the object of rejuvenation, especially of the sexual appetite. One vas deferens is ligatured and resected; the seminiferous tubules in that testis atrophy and its interstitial tissue hypertrophies; this, in its turn, stimulates the other testis and the rest of the generative apparatus. Four cases are here recorded which support the contention. In one old man even his grey hair was replaced by a

growth of black hair. The operation reduces the size of an enlarged prostate.—W. D. H.

1912. (1) Der Einfluss der Samenstrangunterbindung (Steinach) auf den Stoffwechsel. A. Loewy and H. Zondek. **(2) Über die innersekretorische Function der Testikel.** A. Lipschütz. **(3) Unterbindungsbefunde am Hoden unter besonderer Berüchsichtigung der Pubertätdrusenfrage.** H. Tiedje. **(4) Über Hodenüberpflanzung.** R. Mühsam (*Deutsch. med. Woch.*, 1921, **47,** 349, 351, 352, 354-5.)—(1) After Steinach's operation general metabolism is stimulated; details are given. (2) Experiments on guinea-pigs and rabbits with the object of obtaining a quantitative measure of the hypertrophy of the interstitial tissue following removal of portions of testicular tissue (see Abstract No. 1910). (3) The author argues from his observations that the interstitial tissue (puberty gland) is the source of the hormone concerned, but raises the question how far the Sertoli cells participate. (4) After castration, transplantation of a testis restores sexual appetite, though its seminiferous tubes cannot act. (This operation in man, if the new testis is from another man, must have a limited application.)—W. D. H.

1913. Vasomotor Reactions of the Penis. A. C. Crawford and J. M. George (*J. Urol.*, 1921, **5,** 89-118).—Plethysmographic curves of the penis and of the hind leg were taken in the dog. The penis volume was increased by drugs which caused limb dilatation, and also by orchitic extract.—C. L. E.

1914. Reversive Secondary Sex Phenomena. G. Draper (*The Med. Clinics of N. America*, 1921, **4,** 1345-74).—Interesting examples of feminism, virilism, and eunuchoidism.—C. L. E.

1915. Reproductive Organs in Heterosexual Parabiosis of Albino Rats. N. Yatsu (*Anat. Rec.*, 1921, **21,** No. 2).—In male-female parabioses (surgically united individuals) some Graafian follicles develop normally and form corpora lutea, while the majority undergo regressive changes. The uterus is not modified markedly, though hyperplasia of the subserosa may occur. The ovarian follicles of castrated male-female parabioses do not develop normally, and no corpora lutea are formed. Follicular cysts and corpora atretica are abundant. There is noticeable increase in interstitial cells, among which occasional lutein cells occur. The uterus is most affected by union with a castrated male. Hydrometra is especially evident. The testis and prostate are not affected by union with either normal or spayed females.—W. D. H. (*W. I.*).

1916. Internal Migration of the Ovum. G. W. Corner (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 78-83).—An ovum may enter the horn of the uterus on the other side from the ovary, or migrate across to the opposite tube. In the human being such migration is occasionally possible.—W. D. H.

1917. Normal Separation of the Placenta. O. Frankl (*Surg., Gynec., and Obst.*, 1921, **32,** 450-2).—Immediately after delivery of the child the placenta is still fully adherent to the uterine wall, which over the area of insertion is thinner than elsewhere. The next stage is the formation of the retroplacental hæmatoma. Then the muscular wall at the attachment contracts down and assumes the same thickness as in the rest of the uterus. Diminution of the area of attachment thus follows, and not precedes, the separation.—C. L. E.

1918. Über die Function der Hoden und des Eierstockes der enthirnten Schildkröten. L. de Lisi (*Arch. f. Entwicklungsmechanik*, 1921, **47,** 617-26).—Unlike birds and mammals, only slow changes of the sexual glands were observed in decerebrated tortoises. This can be explained easily by the general injury of the animal. No connection exists between the anterior part of the brain and the sexual glands.—H. W.

1919. L'activation parthénogénétique des œufs de grenouille rousse (Rana temporaria L.) dans les milieux hypotoniques et hypertoniques. R. Hovasse (*Compt. rend.*, 1921, **172,** 1137-9).—Unfertilised ova of the frog, deprived of their envelope and placed

in distilled water, first swell, then contract and undergo segmentation. If the envelope is not removed it slowly imbibes water, and segmentation rarely occurs. The effect of a preliminary immersion in solutions of various salts and other substances was also studied. The conclusion is reached that changes in osmotic pressure alone will not account for the phenomena, but that imbibition by the colloid of the egg plays a part.—J. A. M.

1920. Fate of True Solutions (Phenolsulphonephthalein) and Colloids (Trypan Blue) injected into the Mammalian Embryo. G. B. Wislocki (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 93-6).—The first substance injected into the fœtal peritoneal space passes into the fœtal blood-stream through the placenta into the mother's blood, and is excreted by both maternal and fœtal kidneys (cat and guinea-pig); the second, similarly introduced, is absorbed and causes intravitam staining (hepatic endothelium, cells of renal tubes, clasmatocytes, etc.), and is excreted by the fœtal kidneys. The placenta is incapable of transmitting an inert foreign colloid to the mother.—W. D. H.

1921. The Effect of Suckling and Castration on the Lactating Mammary Gland in Rat and Guinea-Pig. C. Kuramitsu and L. Loeb (*Amer. J. Physiol.*, 1921, **56,** 40-59).—Removal of ovaries has no effect until the activity of the mammary gland ceases. During secretion there is mitotic cell proliferation; during intervals, amitotic. The processes in lactation are both structural or formative and functional. An ovarian hormone, in addition to some formative stimulus, is concerned. Invasion by leucocytes occurs in involution.—W. M. B.

MILK

1922. Effect of Diet on Mammary Secretion. G. A. Hartwell (*Biochem. J.*, 1921, **15,** 141-62).—In nursing rats diet influences the quality and/or quantity of milk. The weight of the litter after lactation varies according to the quantity and quality of food consumed by the mother. At the commencement of lactation the mother shows a loss of weight, which is partially kept up by extractives and proteins; excess of the latter causes cessation of lactation; excess of carbohydrate has no effect. Excessive fat diet slows the growth of the litter; absence of fat makes no difference. Fat-soluble A, water-soluble B, the antiscorbutic factor and fat, are supplied by the mother from her own tissues during lactation.—J. A. H.

1923. Dried Milk as a Food for Infants. R. J. Blackham (*Practitioner*, 1921, **106,** 342-6).—Favourable report (compare Abstract No. 3584, Vol. V., p. 566).—W. D. H.

1924. (1) Milchverdünnungen bei jungen Säuglingen. Fetscher (*Deutsch. med. Woch.*, 1721, **47,** 99). (2) J. Levy (*ibid.*, 448).—(1) The author traverses some of the recommendations of Levy (Abstract No. 3583, Vol. V., p. 566). (2) Levy replies, and sticks to his formula.—W. D. H.

1925. Temperature and Milk. J. M. W. Kitchen (*Med. Rec.*, New York, 1912, **99,** 565-9).—A discursive article, from which one can dimly gather that the "clean milk" movement has only inadequately effected its aim; that pasteurisation as usually practised is harmful, and intelligence in the way to apply heat to milk is wanting both in the general public, and especially in milk-dealers.—W. D. H.

1926. Iron as the Cause of a Formaldehyde and Diphenylamine Reaction of Milk. F. Reiss (*Zeit. Nahr.-Genussm.*, 1921, **41,** 26-9).—Traces of iron give reactions with formaldehyde and with diphenylamine-sulphuric acid reagent, and thus erroneously indicate the presence of nitrates. The iron may be derived from the vessels (rusty cans) in which the milk is kept.—W. D. H. (*J. C. Soc.*).

PHARMACOLOGY

1927. Influence of the Acid Radicle on the Anæsthetic Properties of Amino-Alcohols. J. M. Cano and J. Ranedo (*Anal. Fis. Quim.*, 1920, **18,** 184-206).—The anæsthetic properties of hydrochlorides of esters of dimethylaminodimethylethyl-carbinol were studied by measuring the time required to anæsthetise frog's sciatic nerves. The power increases with the molecular weight of the acid radicle of the ester, even though the acids are dissimilar. In esters of the fatty acid series this holds only for intermediate numbers. Thus, while anæsthetic power rises from the butyric to the undecoic ester, the palmitic ester is non-anæsthetic.—W. D. H. (*J. C. Soc.*).

1928. Influence du chloroforme et de la morphine sur l'excitabilité des nerfs. M. and Mme. A. Chauchard (*Compt. rend. soc. biol.*, 1921, **84,** 647-9).—The authors have determined the percentage of chloroform in Ringer's solution in which the sciatic nerve of a frog's sciatic-gastrocnemius preparation must be immersed to alter the value of the chronaxie. They conclude that the amount of chloroform present in the blood in surgical anæsthesia is not enough to affect the excitability of nerves. Morphine has no effect on the chronaxie when applied to the muscle-nerve preparation in this way. —J. H. B.

1929. Influence du chloral et du chloralose sur l'excitabilité des nerfs. M. and Mme. A. Chauchard (*Compt. rend. soc. biol.*, 1921, **84,** 826-8).—Anæsthetic doses of chloral and chloralose do not affect the excitability of nerves. In concentrations great enough to have an influence on the chronaxie there is the difference that while chloral acts on the nerve, chloralose acts on the muscle.—J. H. B.

1930. Anæsthesin. J. Morgenroth (*Ber. deutsch. pharm. Ges.*, 1921, **31,** 76).—Treatment of the rabbit's cornea with anæsthesin (ethyl-*p*-aminobenzoate) for 3 mins. produced anæsthesia lasting 32 mins. Its derivative ethyl-*p*-hydrazin-benzoate acted similarly, but ethyl-*p*-allylthiocarbamido-benzoate had little or no action. Other derivatives were also tested, and insoluble products acted more powerfully than soluble salts.—W. D. H. (*J. C. Soc.*).

1931. Anästhesierende Wirkung des Kaffees. B. Alexander (*Deutsch. med. Woch.*, 1921, **47,** 272).—Coffee infusion locally applied to nose or eye lessens their sensibility. So does a solution of caffeine, and even a cup of good coffee internally does the same. The effect is too small to be of any good.—W. D. H.

1932. Influence of Sedatives on Animals. I. Method for Measuring the Influence of Stimulating Drugs and Sedatives on Activity. W. Storm van Leeuwen (*J. Pharm. Expt. Ther.*, 1921, **17,** 169-76).—The animal is placed in a cage, the bottom of which is suspended on 4-coil springs. Movements of the cage bottom in a perpendicular direction are recorded by a mechanical device. Records of the extent of the animal's movement throughout any period can be obtained, and thus the sedative or stimulating effect of drugs on an animal's activity be recorded.—E. M.

1933. Sur l'involution du processus spermatogénétique provoquée par l'alcoolisme expérimental. A. Kostitch (*Compt. rend. soc. biol.*, 1921, **84,** 674-6).—Alcohol has a harmful effect on spermatogenesis in white rats.—J. H. B.

1934. A Comparison of the Action of Certain Drugs upon Muscular Work in Frogs. Eleanor M. Scarborough (*J. Pharm. Expt. Ther.*, 1921, **17,** 129-40).—Alcohol and veratrine, when added to the perfusion fluid, temporarily increase the amount of work done by frog's muscles. In the case of alcohol this is followed by lessened excitability and diminished response. Cocaine directly depresses striated muscle without any preliminary increase in response. Caffeine increases the excitability and response of muscle to single stimuli. Its action on fatigued muscle is very slight.—E. M.

1935. Phenolipoids. V. P. Piazza (*Atti d. r. acad. d. sci. med.*, Palermo, 1920), F. Aliquo (*Ann. di clin. med.*, **10,** fasc. 4), V. Guerchio (*Riv. sanitaria siciliana*, 1921, **9,** No. 2).—The first paper relates to the preparation of various compounds of phenol, camphor, and similar substances with lecithin and cholesterol from egg yolk and brain. They are stated to be antibacterial. The second paper confirms this view, and relates experiments on rabbits infected with staphylococcus, the majority of which recovered after subcutaneous or intravenous injections of some of these phenolipoids. The third paper details good results in man (influenza cases) after subcutaneous or intramuscular injections.—W. D. H. (*Lancet*).

1936. The Effect of Small Doses of Atropine on the Heart-Rate. H. McGuigan (*J. Amer. Med. Assoc.*, 1921, **76,** 1338-40).—As is known, small doses (1 mg. or less) cause slowing of the heart by exciting the vagus centre. With doses over 2 mg. this is very transient, and is succeeded by the usual effect.—C. L. E.

1937. Action of Digitalis and Atropine. I. Harris (*Lancet*, 1921, i., 1072-4).—In man digitalis lowers both diastolic and systolic pressure, but the latter to a less degree, so that the pulse pressure (*i.e.*, difference between the 2) rises. The drug increases the blood in the heart. Atropine under the skin in doses of less than $\frac{1}{50}$ gr. causes a fall in systolic, and a smaller fall in diastolic pressure; therefore the pulse pressure falls, the heart-rate decreases, and this is attributed to vagus stimulation. Larger doses increase the heart's rate owing to vagus paralysis. Previous administration of digitalis makes no difference.—W. D. H.

1938. Über die Wirkung des kristallisierten Lobelins auf das Atemzentrum. A. Eckstein, E. Rominger, and H. Wieland (*Zeit. f. Kinderheilk.*, 1921, **28,** 218-42).—Crystallised lobeline (a base isolated from *Lobelia flata*) is a specific stimulant of the respiratory centre, and has no harmful effects (experiments on animals and men). It is of value, especially in cases with acute respiratory collapse and pneumonia in children, or if the centre has been paralysed by chloral hydrate. The dose for sucklings is 1 to 3 mg. subcutaneously.—H. W.

1939. Effect of Quinine on the Liver, Blood-Cells, and Urine of Rabbits. D. M. Siperstein and M. Litman (*Arch. Int. Med.*, 1921, **27,** 449-56).—Rabbits which received intravenously doses of quinine hydrochloride varying from 30 to 80 mg. per kilo showed degenerative changes in the liver (dilated sinusoids, vacuolation, fatty degeneration, nuclear changes) which were marked 48 hours after, but were practically gone in 96 hours. Red blood-cells increased 25 to 50%. The authors claim that there was also a polyuria, but from their figures this was not marked.—J. H. B.

1940. Nephelometric Estimation of Quinine in Blood. H. W. Acton and H. King (*Biochem. J.*, 1921, **15,** 53-9).—A modification of the Ramsden and Lipkin technique. The method is not quantitative, and is tedious. The quinine in blood is approximately uniformly distributed between corpuscles and serum in defibrinated goat's blood. Morgenroth's theory as to the action of quinine is not supported. (In the paper the words serum and plasma appear to be confused.)—J. A. H.

1941. Chinidin als Herzmittel. E. Jenny (*Schweiz. med. Woch.*, 1921, **51,** 272-5).—Quinidine is a heart remedy of great value. It counteracts auricular fibrillation in arhythmia perpetua.—H. W.

1942. New Preparations which Hasten the Coagulation of Blood. Nonnenbruch and W. Szyszka (*Deut. Arch. klin. Med.*, 1920, **134,** 174-84).—Ethylenediamine in certain acid combinations, as acetic acid ethylenediamine, theophylline-ethylenediamine (euphyllin), and diethylenediamine, are clinically useful in markedly accelerating coagulation. Caffeine and theophylline have these properties to some extent. These substances, in contrast to the usual clinical methods, which are active only for 1 to $1\frac{1}{2}$ hours, have an action for several hours. In most experiments the acceleration was over 50%. These

substances inhibit coagulation *in vitro*. Their action in the body apparently rests on an increase of the fibrin ferment. There is no reason to believe that their action depends on a toxic action. There is probably an action on the spleen, because in several rabbits from which the spleen was removed euphyllin had no action. Several cases of hæmoptysis were improved by the intravenous injection of 0·48 g. of euphyllin.—W. D. H. (*Chem. Abstr.*).

1943. Die pharmakologische Functionsprüfung des vegetativen Nervensystems im Kindesalter—II. E. Friedberg (*Arch. f. Kinderheilk.*, 1921, **69,** 107-32).—The irritability of the vegatative nervous system towards drugs is raised in children suffering from neuropathy and psycho-neuroses. Some cases of asthma, etc., show true vagotonic reactions; and in spasmophilia the high irritability of the motor nerves is only rarely accompanied with the same state in the vegetative nervous system. They thus differ from adults. Pharmacological examination of cases of rickets gives no clue to the increase of tonus in the parasympathetic system. Endocrine disturbances form another factor, and the value of the pharmacological examination for diagnosis is limited.—H. W.

1944. Über den Einfluss der Salze auf den Wasserumsatz. W. Lasch (*Deutsch. med. Woch.*, 1921, **47,** 94-5).—K salts are diuretic, Na salts cause retention of water, and Ca salts are intermediate.—W. D. H.

1945. Influence of Colloids on the Action of Non-Colloidal Drugs—II. W. S. van Leeuwen and J. Zeijdner (*J. Pharm. Expt. Ther.*, 1921, **17,** 121-8).—Atropine, when added to rabbit's serum, loses a large part of its power to inhibit contraction of the intestine produced by pilocarpine. This is not because of the destruction of atropine, for it can be regained in an active form by treating the serum with alcohol and filtering.—E. M.

1946. Behaviour of a Fixed Oil (Peanut Oil) injected Intraperitoneally. E. W. Schwartze (*J. Pharm. Expt. Ther.*, 1921, **17,** 115-20).—Except for the loss of added dye (Sudan III.), the oil often remained unchanged in the peritoneal cavity for 24 weeks. Occasionally conglomerations of cyst-like spheres containing oil and other material were formed.—E. M.

1947. Effect of Ipecac in the Treatment of Infectious Entero-Hepatitis (Blackhead) in Turkeys. H. M. Wegeforth and P. Wegeforth (*J. Pharm. Expt. Ther.*, 1921, **17,** 249-59).—Infectious entero-hepatitis can be experimentally produced in turkeys by allowing them to feed on the viscera of a bird which has succumbed to this disease. The administration of ipecacuanha has both preventive and curative action.—E. M.

1948. Crise nitritïode expérimentale chez le chien par injection intraveineuse de novarsénobenzol. M. Pomaret (*Compt. rend. soc. biol.*, 1921, **84,** 781-3).—An investigation of the fall of blood-pressure in dogs under chloral after giving N.A.B. in various solutions intravenously. The fall only occurs with acid solutions. As a result it is suggested that in treating patients with N.A.B. a low alkali reserve should first be rectified by administration of sodium bicarbonate.—J. H. B.

TOXICOLOGY

1949. Tea Intoxication. M. A. Starr (*Med. Rec.*, New York, 1921, **99,** 463-5).—Those who have been in the United States would hardly have expected the necessity for this alarmist view. Perhaps since the war "evil" English habits are spreading. Tea prohibition is hinted at, but not actually advocated. (A visit to a great tea-drinking country, such as Australia, would probably modify the author's views.)—W. D. H.

1950. Chronic Intoxication in Albino Rats. IV. Fluoride, Chloride, and Calcium. T. Sollmann, O. H. Schettler, and N. C. Wetzel (*J. Pharm. Expt. Ther.*, 1921, **17,** 197-226).—Sodium fluoride, when eaten by rats in daily doses of 15 to 150 mg. per kilo body-weight, produced progressive impairment of growth and food consumption. The ill health outlasted the administration of the drug. Flouride in the form of "phosphate rock" produced the same deleterious action, while the other constituents of this "rock," such as calcium phosphate and carbonate, had no such action. Smaller doses of NaF (8 mg. per kilo) had no deleterious effect in 9 weeks.—E. M.

1951. Sur le lathyrisme ou intoxication provoquée par les graines de gesses. M. Mirande (*Compt. rend.*, 1921, **172,** 1142-3).—A war investigation. Fatal cases of poisoning occurred in horses fed on seeds of *Lathyrus sativus* and *L. cicera*. Death was due to asphyxia. It was found that the crushed and moistened seeds underwent autofermentation and disengaged H_2S.—J. A. M.

1952. Über Kampfgasvergiftungen: I. Über Reizgase. F. Flury (*Zeit. ges. exp. Med.*, 1921, **13,** 1-15). **II. Über Zersetzung der Kampfstoffe durch Wasser.** P. Rona (*ibid.*, 16-30). **III. Experimentelle Pathologie der Phosgenvergiftung.** E. Laqueur and R. Magnus (*ibid.*, 31-179). **IV. Ergänzende Befunde zur pathologischen Anatomie der Phosgenvergiftung.** O. Heitzmann (*ibid.*, 180-99). **V. Experimentelle und theoretische Grundlagen zur Therapie der Phosgenerkrankung.** E. Laqueur and R. Magnus (*ibid.*, 200-90). **VI. Die Chlorpikrinvergiftung.** M. Gildemeister and W. Heubner (*ibid.*, 291-366). **VII. Die pharmakologische Wirkung des Dichloräthylsulfids.** F. Flury and H. Wieland (*ibid.*, 367-483). **VIII. Die pathologisch-anatomischen Veränderungen nach Vergiftung mit Dichloräthylsulfid unter Berücksichtigung der Tierversuche.** O. Heitzmann (*ibid.*, 484-522). **IX. Lokalreizende Arsenverbindungen.** F. Flury (*ibid.*, 523-78).—Titles given for those interested.—H. W.

1953. La valeur des moyens actuels de diagnostic dans les empoisonnements par les alcaloïdes. M. de Laet (*Arch. de méd. légale*, 1921, 262-72, 378-97).—Revue critique.—E. Z.

1954. Etude de l'absorption des rayons ultra-violets par des solutions d'alcaloïdes. M. de Laet (*Arch. de méd. légale*, 1921, 454-89).—Etude des courbes d'absorption des rayons ultra-violets par des solutions aqueuses de chlorhydrate de morphine, de vératrine, de sulfate de quinine, de caféine, de chlorhydrate de cocaïne, de sulfate de strychnine, de nitrate d'aconitine, de digitaline, de colchicine. Ce procédé est très sensible et spécifique.—E. Z.

1955. Les arsénobenzènes, leur composition, leur toxicité. F. de Myttenaere, F. Magnus et Van Boeckel (*Bull. de l'acad. roy. de méd. de Belgique*, 5e serie, 1921, **11,** 102-4).—Les auteurs ont comparé, au point de vue qualitatif, le néosalvarsan, le novarsénobenzol et le sulfarsénol. Ils ont ensuite dosé l'arsénic, l'azote le soufre, le sodium, l'humidité, et, en outre, pour certains des produits examinés, le chlorures sodique. Les résultats analytiques démontrent que ces divers produits n'ont pas de composition constante. Il-y-a, de plus, dans la plupart d'entre eux un déficit d'azote vis-à-vis de l'arsénic, révélant la présence d'un produit arsénical autre que le salvarsan mono- ou bi-sublimé. Au point de vue de la recherche de leur toxicité, les auteurs ont institué deux procédés: L'un décèle et dose l'arsénoxyde $[O : As(C_6H_3)OH.NH_2]$. L'autre extrait des différents produits l'arsénic minéral ou facilement minéralisable et le dose. Les résultats de cette dernière méthode s'énoncent en centimètres cubes de solution normale 100 d'hyposulfite de soude. On est frappé du parallélisme présenté par l'échelle des résultats chimiques ainsi obtenus et celle des toxicités relatives des divers échantillons examinés chez le lapin et la souris.—E. Z.

1956. Chemotherapy of Arsenical Compounds. G. W. Raiziss, J. F. Schamberg, and J. A. Kolmer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 149-51).—The toxicity as well

as the curative power of organic arseno-compounds depends to a considerable extent upon whether the amino-groups are free or substituted.—D. H. de S.

1957. Magnesium Sulphate in Arsenic Poisoning. Olga S. Hansen (*J. Pharm. Expt. Ther.*, 1921, **17,** 105-14).—There is great difference in the susceptibility of rabbits to arsenic, and, further, $MgSO_4$, whose action as an antidote to arsenic has been tested in these experiments, is itself toxic. There is, however, evidence of such an antidotal action in that $MgSO_4$ produced a prolongation of the average life of 50 rabbits poisoned by arsenic from 219 to 415 hours on the average. There was no saving of life.—E. M.

1958. Une nouvelle intoxication professionnelle arsénicale. A. Slosse (*Compt. rend. de la soc. belge de biol.*, 1921, **55**).—L'auteur signale, qu'il a eu l'occasion de constater la présence d'arsénic dans le sang, les cheveux et les ongles de personnes appelées à préparer les solutions des composés arsénicaux, en usage dans le traitement de la syphilis. Il voit dans ce fait l'origine des troubles divers présentés par ces malades.—E. Z.

1959. The Spirochæticidal Value of Disodium Ethyl Arsinite (Mon-Arsone). H. J. Nichols (*J. Amer. Med. Assoc.*, 1921, **76,** 1335-6).—The tissues are killed as soon as the spirochætes.—C. L. E.

1960. Adsorption of Poisons. II. The Adsorbent Power of Rabbit's Serum for Atropine. W. S. v. Lecuwen and J. Zeijdner (*Proc. Kon. Akad. v. Wetensch.*, **23,** 486).—The great resistant power of rabbits for atropine is, according to the authors, chiefly based upon the adsorbent power of rabbit's serum for the alkaloid. The value of atropine solutions was measured by the amount able to abolish the action of pilocarpine on a surviving piece of cat's intestine. It was shown that the action of atropine which had been previously in contact with rabbit's serum was weakened to such an extent that less than $\frac{1}{50}$ of the original action is left. Atropine solutions which had been in contact with rabbit's serum became again active when they were treated with hydrochloric acid and alcohol. This proves that the atropine was adsorbed, and not chemically destroyed. The nature of the adsorbing substance(s) is not yet known. Sodium citrate and peptones lessen the adsorbent power of the serum.—R. B.

1961. Black Spider Poisoning. D. J. Louis (*J. Amer. Med. Assoc.*, 1921, **76,** 99).—The black spider (Mexico) is extremely poisonous. The animal resembles the ordinary spider; 3 or 4 hours after a person is bitten a pustular eruption develops, the part swells, there is nausea and vomiting. Treatment consists in applying gauze wet with a saturated solution of $MgSO_4$ to the affected area, and the internal administration of 4 minim doses of I. The $MgSO_4$ apparently relieves the pain, reduces the swelling, and prevents the progress of the disease. In none of the 4 cases with histories reported were bacteria found in blood or serum, and an examination of the urine was negative. Blood-counts revealed a slight excess of leucocytes.—W. D. H. (*Chem. Abstr.*).

PATHOLOGY

1962. Hookworm Infection in Brazil. S. T. Darling and W. G. Smillie (*Monographs of Rockefeller Inst.*, New York, 1921, No. 14, 42 pp.).—Reference given for those interested.—W. D. H.

1963. Increased Amount of Uric Acid in the Blood in the Toxæmias of Pregnancy. J. L. Williams (*J. Amer. Med. Assoc.*, 1921, **76,** 1297-9).—In cases of eclampsia, pernicious vomiting, and pre-eclamptic toxæmia with arterial hypertension, but not in nervous vomiting, the uric acid is definitely increased. After delivery and recovery from the symptoms there is a return of the uric acid to normal.—C. L. E.

1964. Lecithin, Cholesterol, and Hæmolysis. H. M. Clark and F. A. Evans (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 113-21).—The protective power of normal serum against

hæmolysis by sodium oleate or saponin is not dependent on cholesterol, lecithin, or combinations of the 2 substances. The loss of such power in hæmolytic anæmia cannot be explained by the diminution of cholesterol noted in this disease.—W. D. H.

1965. Über die Bedeutung der Alkaliphosphate für die Spasmophilie. K. Jeppsson (*Zeit. f. Kinderheilk.*, 1921, **28,** 71-167).—The alkaline phosphates of milk favour the progress of spasmophilic symptoms. In experiments (children and animals) alkaline phosphates (especially of Na and K) produce the same symptoms. All of the alkaline salts do not produce the typical effect, but, on the other hand, the reaction is also not wholly due to the phosphoric acid, for certain other potassium salts also cause increase of irritability. The importance of the HPO_4 ion is not merely due to its capacity to diminish the Ca content of the body, although this circumstance has a certain influence. Abnormal cumulation of P is observed in the organs of spasmophilic children. Children with latent spasmophilia should be treated with whey deprived of the greatest part of its phosphates.—H. W.

1966. A Form of Galvanic Hyperæsthesia in Fragilitas Ossium. G. C. Bolten (*Ned. T. v. Geneesk.*, 1921, **65,** 952).—In addition to the usual symptoms, the author found in 4 cases an unusually ready response to the break of a constant current. The symptoms are all genetically related, and are attributed to endocrine disturbance (insufficiency of thymus, parathyroid, and probably to a slight degree of thyroid also).—R. B.

1967. Absence of Pancreatic Secretions in Sprue and the Benefit of Using Pancreatic Extract. T. R. Brown (*Amer. J. Med. Sci.*, 1921, **161,** 501-7).—The thesis is stated in title.—W. D. H.

1968. Über den relativen Phosphorgehalt des Blutes. Eine Studie zur Biologie des Carcinoms. W. Gröbly (*Arch. f. klin. Med.*, 1921, **115,** 261-74).—The phosphorus quotient $\left(\frac{\text{P content in mg. in 10 c.c. blood}}{\text{number of the red cells in millions}}\right)$ is in normal persons 2·5 to 2·9; in cases with malignant neoplasms much higher (4·5). The author characterises this state as a "status nucleohyperplasticus." In tuberculosis, morbus Basedowii, etc., the value is 2·5 (status nucleohypoplasticus). This quotient is an objective measure of the capability of the organism to synthesise nucleoproteins. A too high capability could be the cause of a disposition to malignant growth.—H. W.

1969. Grossesse et phénomènes de choc anaphylactique. A. Lumière and H. Couturier (*Compt. rend.*, 1921, **172,** 772-4).—Continuing their researches (see Abstract No. 572, Vol. VI., p. 88), the authors found that female guinea-pigs sensitised to horse serum, if pregnant, were insusceptible to anaphylactic shock. They were also insusceptible to the anaphylactoid shock produced by injection of a suspension of barium salts. The blood of such animals conferred no immunity when injected into sensitised males. After delivery the females again became sensitive.—J. A. M.

1970. Tension superficielle et antianaphylaxie. W. Kopaczewski (*Compt. rend.*, 1921, **172,** 936-9). **Tension superficielle et choc anaphylactique.** A. Lumière (*ibid.*, 1071-2). —Polemical.—J. A. M.

1971. Relation of Antibody and Antigen to Serum Disease Susceptibility. G. M. Mackenzie and W. H. Leake (*J. Exp. Med.*, 1921, **33,** 601-20).—In 19 patients to whom foreign serum had been administered for therapeutic purposes, a study of the precipitin and precipitinogen in the circulation showed 3 distinct groups. The first group of 11 were good precipitin formers, had severe serum disease, and the precipitinogen disappeared about the time that the symptoms subsided. Four cases showed little serum disease and little precipitin, but persistent precipitinogen. The other 4 cases were intermediate. The results lend support to the view that serum disease is an antigen-antibody reaction.—C. L. E.

1972. Blood Changes in Pneumococcus Infections. Formation and Fate of Methæmoglobin in the Blood. W. C. Stadie (*J. Exp. Med.*, 1921, **33,** 627-40).—Decrease in oxygen capacity of the blood in pneumonia is probably due to a formation of methæmoglobin. The latter is removed from the circulation as rapidly as it is formed, so that it can seldom be detected, and is probably never a cause of cyanosis.—C. L. E.

1973. Beitrag zum Resistenzproblem bei Frühgeborenen. R. Kyrklund (*Zeit. f. Kinderheilk.*, 1921, **28,** 168-82).—Prematurely born children possess the same bactericidal power as those born at full term. The only condition which diminishes it is an acute disturbance of nutrition; this is true also for normal children, but in a less degree. —H. W.

1974. Allergical Immunity and Anaphylaxis. D. Klinkert (*Ned. T. v. Geneesk.*, 1921, **65,** 1685).—The phenomena of v. Pirquet, of Koch, and of Arthus, are considered to be allergical reactions, the reactive inflammation being efficient, for it leads to healing. The nervous allergy of the bloodvessels is the necessary prelude to phagocytosis, and probably also to humoral immunity, for then only lymph, which contains specific antibodies, can leave the bloodvessels. When a protein abnormal to the organism or an infective substance is injected for the second time directly into the blood-stream of a sensitive animal (man or guinea-pig), anaphylactic shock is elicited instead of nervous allergy. An argument in favour of this view is that anaphylactic shock is prevented by general narcosis, and the allergical skin reaction by local anæsthesia. Anaphylactic shock is an artificial phenomenon which suddenly brings about the defensive nervous discharge.—R. B.

1975. Simple Quantitative Serum Reaction for Diagnosis of Syphilis. G. Dreyer and H. K. Ward (*Lancet*, 1921, i., 956-61).—This is a reaction of Wassermann type. The details, given in full, must be studied in the original article by the specialists concerned. The report on results is good.—W. D. H.

PLANT PHYSIOLOGY

GENERAL

1976. Zur Physiologie der Zellteilung. VI. Über Auslösung von Zellteilungen durch Wundhormone. G. Haberlandt (*Sitzungsber. d. preuss. Akad. d. Wiss.*, 1921, 221-34). —After wounding Kohlrabi, cell division takes place actively in the layer below the wound, but much less actively if the wounded surface is washed with tap-water. But if a thin layer of tissue pulp is placed on top of the washed wounded surface, active cell division takes place. Similar observations were made with other species. These results are adduced as evidence of a wound hormone resulting from the decomposition of the cell contents of the injured cells.—W. S.

1977. Sur la signification biologique des alcaloïdes dans les plantes. G. Ciamician and C. Ravenna (*Compt. rend.*, 1920, **171,** 836-9).—The point that the authors consider is the frequent substitution, in amino-, imino-, and other groups, of alcoholic or acidic radicles for hydrogen. It has been suggested that these substitutions diminish the activity of these toxic unexcreted end-products of plant metabolism. By direct experiment, however, it is concluded that the substituted products are more active than the original. It is also found that they are more resistant to the oxidising agents in plant cells. These two points lead the authors to hold that alkaloids are not waste products, but permanent effective substances of a hormone nature.—F. F. B.

CHEMICAL

1978. Extraction des glucosides de deux orchidées indigènes: identification de ces glucosides avec la loroglossine. P. Delauney (*Compt. rend.*, 1920, **171,** 435-7).—Described adequately by title.—F. F. B.

1979. Sur la membrane de quelques algues floridées et sur la gelation de l'hydrosol gélosique. C. Sauvageau (*Compt. rend.*, 1920, **171,** 606-9).—Details are given of the wall structure and reactions of the marine algæ yielding gelose. An accompanying amyloid blues with iodine.—F. F. B.

1980. Indicateur automatique de la teneur en humidité dans les céréales. M. Chopin (*Compt. rend.*, 1920, **171,** 860-2).—An apparatus, designed for the milling trade, is figured and described, in which the grains of cereals are introduced into a cylinder at the constant temperature of 230° C. The water thus vaporised is distilled to the outside into a graduated cylinder, calibrated in terms of percentage water content of the sample. By continuously rotating air-tight valves in the form of cups at the upper and lower ends of the heating cylinder, this is kept charged with grain passing slowly down through it. It is suggested that this machine might be used for other granular humid materials.—F. F. B.

1981. De l'action contraire des chlorures et des sulfates solubles sur les matières amylacées. H. Courtonne (*Compt. rend.*, 1920, **171,** 1168-70).—Saturated $ZnCl_2$ will transform starch to paste in the cold, and to soluble starch on heating. Other chlorides have this property in less degree, according to their solubility. Sulphates have the opposite effect; in strong $MgSO_4$ starch grains can be heated to 115° C. without a trace of swelling.—F. F. B.

1982. Anthocyanins and Anthocyanidins. IV. Observations on (*a*) **Anthocyan Colours in Flowers, and** (*b*) **The Formation of Anthocyans in Plants.** E. A. Everest and A. J. Hall (*Proc. Roy. Soc.*, 1921, **92B,** 150-162).—The results of Shibata, Shibata and Kasiwagi as to the nature of anthocyan colours is criticised. Observations and analyses of young flowers which develop anthocyan when mature indicate that anthocyan colours are developed from flavonol derivatives, and not *vice versa*, as has been suggested.—G. E. B.

1983. Formation of Hydrocyanic Acid in Plants. P. Menaul (*J. Biol. Chem.*, 1921, **46,** 297).—Solutions containing CO_2, formaldehyde, and potassium nitrate were exposed to sunlight. HCN was formed in the solution with acid reaction; but not in those with alkaline. This is considered significant, since the sap of plants is slightly acid.—G. E. B.

1984. The Proteins of the Tomato Seed, Solanum esculentum. C. O. Johns and C. E. F. Gersdorf (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxvi).—Two globulins with a high sulphur content were isolated. No indication of the presence of albumin or glutelins was found.—J. C. D.

1985. Acerin: The Globulin of Maple Seed (Acer saccharinum). R. J. Anderson and W. L. Kulp (Proc. Amer. Soc. Biol. Chem., *J. Biol. Chem.*, 1921, **46,** xxxvi-vii).—This protein is a globulin. An analysis is given. It is rich in lysine.—J. C. D.

1986. Investigations on the Nitrogenous Metabolism of the Higher Plants. I. The Isolation of Proteins from Leaves. A. C. Chibnall and S. B. Schryver (*Biochem. J.*, 1921, **15,** 60-75).—By treating pulp of leaves of cabbage, scarlet runner, and spinach with ether-saturated water, opalescent colloidal solutions are obtained from which precipitation of the colloid takes place on standing at room temperature above 20° C., or more rapidly on warming to 40° C. These precipitates consist mostly of proteins, and contain about 10% N. From these precipitates purer preparations of proteins have been prepared containing about 13% N.—W. S.

1987. Constituents of the Bark of Zanthoxylum macrophyllum, Oliver. J. A. Goodson (*Biochem. J.*, 1921, **15**, 123-8).—Analytical details. Fagaramide and lupeol were prepared.—W. S.

1988. The Biochemistry of Carbohydrate Production in the Higher Plants from the Point of View of Systematic Relationship. F. F. Blackman (*New Phyt.*, 1921, **20**, 2-9).—There is a general uniformity in carbohydrate economy in flowering plants, with some notable exceptions. These are reviewed and considered with regard to a possible biochemical classification of plants.—W. S.

1989. Suberin and Cutin. J. H. Priestley (*New Phyt.*, 1921, **20**, 17-29)—A review of present knowledge of suberin and cutin in cell walls.—W. S.

1990. An Alkaloid from Sinomenium diversifolius. N. Ishiwari (*Chûgai Iji Shimpô*, 1920, **959**, 1-20).—A new alkaloid, *sinomenine*, $C_{16}H_{19}NO_3,H_2O$, white needles, m.p. 161°, was isolated from the hot alcoholic extract of *Sinomenium diversifolius* (Miq.); its properties are described.—W. S. (*J. C. Soc.*).

1991. The Extraction of Tannin (Gallotannic Acid). E. Knape (*Chem. Zeit.*, 1921, **45**, 239-41).—Galls are swollen with water, ground up and extracted with ether, ether alcohol, trichloroethylene, or dichloroethylene, for 20 to 30 mins. in a shaker. The extract is filtered off, and 3 more extractions are made. A clearer, brighter solution of gallotannic acid is thus obtained than from dry powdered galls, and less solvent is required.—W. S. (*J. C. Soc.*).

1992. Essential Oil of Juniperus taxifolia. Y. Shinosaki (*J. Chem. Ind. Japan*, 1921, **24**, 202-8). **Essential Oil of Vitex trifolia** (*ibid.*, 191-202).—Yield and composition of the oils are given.—W. S. (*J. C. Soc.*).

1993. Solubility of Crystalline Substances in Caoutchouc. G. Bruni (*Atti R. Accad. Lincei*, 1921 [v.], **30**, i., 75-80; also *Giorn. Chim. Ind. Appl.*, 1921, **3**, 51-3).—Towards various solvents caoutchouc behaves rather as solvent than as solute. Admixture of 10% of azobenzene with caoutchouc yields a transparent, orange-yellow jelly, which rapidly becomes opaque owing to deposition of crystalline azobenzene. Binary systems formed by resin-free caoutchouc with azobenzene, naphthalene, and *p*-toluidine exhibit normal behaviour; the caoutchouc acts towards the crystalline constituent as an ordinary solvent, forming true, saturated solutions, which readily exhibit supercooling and supersaturation. The colloidal character of caoutchouc plays no part in these phenomena. The curve connecting temperature and composition indicates the formation of complexes between the caoutchouc and the crystalline components of the systems. Prolonged heating of the systems produces no permanent alteration in the molecular state of the caoutchouc.—W. S. (*J. C. Soc.*).

ENZYME ACTION

1994. Sur l'existence d'une émulsine dans l'extrait de malt. M. H. van Laer (*Réunion de la soc. belge de biologie*, 26 Février, 1921, 471-2).—L'extrait de malt renferme une émulsine, dont l'optimum d'action correspond à la neutralité au méthylorange.—E. Z.

1995. The Enzymes of B. coli communis. V. (*a*) Anaerobic Growth followed by Anaerobic and Aerobic Fermentation; (*b*) The Effects of Aeration during Fermentation. E. C. Grey and E. G. Young (*Proc. Roy. Soc.*, 1921, **92B**, 135-50).—Anaerobic fermentation of glucose by an emulsion of *B. coli communis* proceeds differently according as the organisms have been grown previously with or without oxygen. When the immediate past history has been anaerobic, the succinic acid produced is greatly diminished, whilst little or no lactic acid is formed. Admission of oxygen leads to lactic acid production. The succinic acid is replaced by acetic acid. The effect of aeration on the fermentation is to increase the lactic, acetic, and succinic acids, and to diminish the hydrogen, carbon

dioxide, and formic acid, but to leave the alcohol unchanged. The products of aerobic fermentation contain not more, but less, oxygen. It appears that the introduction of oxygen diminishes the part played by water in the reactions.—G. E. B.

1996. Studies on the Cycloclastic Power of Bacteria. III. A Quantitative Study of the Aerobic Decomposition of Tryptophan and Tryosine by Bacteria. H. Raistrick and Anne B. Clark (*Biochem. J.*, 1921, **15,** 76-82).—From the results of this study it is concluded that both in presence and absence of glycerol *B. pyocyaneus*, *B. fluorescens*, and *B. prodigiosus* can produce ammonia from both the side chain and the indole nucleus of the tryptophan molecule. *B. prodigiosus* produces ammonia much more quickly from the side chain than from the nucleus, but the other 2 spp. produce ammonia about as quickly from the nucleus as from the side chain. *B. proteus vulgaris* can only attack the side chain. With the first 3 organisms much free ammonia is produced in absence of glycerol, but little synthesised N.; in presence of glycerol practically no free ammonia is formed, but considerable amounts of synthesised N. In the absence of glycerol the same result is obtained in the attack of tyrosine by *B. pyocyaneus* and *B. fluorescens*, but in presence of glycerol there is a total absence of free ammonia, together with relatively large amounts of synthesised N.—W. S.

1997. Oxidising Enzymes. IV. The Distribution of Oxidising Enzymes among the Higher Plants. Muriel W. Onslow (*Biochem. J.*, 1921, **15,** 107-12).—Species from 286 orders (about 60% of the total number) of Angiosperms were examined for an oxygenase which would catalyse the oxidation of catechol. Species from about 62% of these orders were found to contain such an enzyme. Of monocotyledonous orders examined 76% contained spp. with the enzyme, while of the dicotyledonous orders the percentage was 60. The enzyme is more frequent in the Sympetalæ (84% of orders examined) than in the Archichlamydeæ (51% of orders examined).—W. S.

1998. Oxidising Enzymes. V. Further Observations on the Oxidising Enzymes of Fruits. Muriel W. Onslow (*Biochem. J.*, 1921, **15,** 113-7).—The cherry, peach, medlar, strawberry, grape, fig, and mulberry, contain an oxidase (oxygenase, catechol substance, and peroxidase); blackberry, red and black currants, gooseberry, grape fruit, pomegranate (inner tissues), pineapple, melon, and tomato, contain a peroxidase.—W.S.

1999. Effect of Acetaldehyde and Methylene Blue on the Fermentation of Glucose and Fructose by Yeast Juice and Zymin in Presence of Phosphate and Arsenate. A. Harden and F. R. Henley (*Biochem. J.*, 1921, **15,** 175-85).—Acetaldehyde diminishes the time required by a mixture of fructose and phosphate to attain its maximum rate of fermentation in presence of yeast juice or zymin, but does not substantially increase the maximum rate obtainable. In presence of acetaldehyde fructose is more rapidly fermented than glucose in presence of phosphate, both by yeast juice and zymin. Acetaldehyde is about 50 times as effective as fructose (when molecular quantities are compared) in " inducing " fermentation in a mixture of glucose with excess of phosphate. Arsenate does not affect the accelerating action of acetaldehyde in the presence of phosphate in the fermentation of glucose and fructose by yeast juice, but considerably increases the rate attained with glucose, and to a less degree that attained with fructose, when zymin is used. Methylene blue produces an effect similar to that of acetaldehyde in the fermentation of both fructose and glucose by zymin and yeast juice in presence of phosphate.—J. A. H.

VEGETATIVE DEVELOPMENT

2000. The Concentration of Sodium Nitrate tolerated by Tobacco Plants. G. D. Buckner, A. M. Peter, and E. J. Kinney (*Soil Science*, 1920, **10,** 487-91).—Results of experiments with tobacco plants indicate that solutions containing 2 or 3 parts of sodium nitrate in 3,750 parts of tap-water give the best general development.—C. W.

2001. Pruning Investigations: Second Report. J. R. Magness, A. F. Edminster, and V. R. Gardner (Oregon Agric. Exp. Stat. Div. of Horticulture, *Bull.* **146,** 1917, 1-74).—A statistical study of 1,055 individual Grimes shoots in young trees upon winter heading-back warrants the following statements: In general, heading the individual dormant apple shoot decreased the number of new branch shoots to which it gave rise, this decrease in number of new shoots being greater with increase in severity of heading. Heading-back resulted in a decrease in number of fruit spurs to which the individual shoot gave rise, the decrease being more marked with increase in the severity of heading. In other words, fruit-spur formation on the individual shoot is correlated with the length of the shoot after, rather than before, pruning. A statistical study of the comparative effect of winter heading-back and of thinning-out in 461 young apple trees warrants the following statements: A general heading-back of the shoots of a tree acted as a stimulus to new shoot growth, the amount of this stimulus varying considerably with variety of apple tested. On the other hand, an equally severe thinning acted as a check to new shoot growth. A decrease in fruit-spur formation accompanied winter shoot pruning of any kind—either thinning-out or heading-back. There was little difference between the effects upon increase in trunk circumference of winter heading-back and winter thinning-out.—C. W.

2002. Factors affecting the Depth of Sowing Various Corps. F. S. Harris and H. J. Maughan (Utah Agric. Exp. Stat., *Bull.* **164,** 1918, 1-18).—Figures and tables containing the results from 17,280 determinations are presented to show the effect of the depth of seeding on the germination and growth of wheat, oats, corn, barley, alfalfa, peas, beets, beans, and sorghum. In general the height of the plants above the soil decreased as the depth of seeding increased. The largest growth of the plants above ground never occurred from seeds sown deeper than 3 ins.—C. W.

2003. Recherches sur la greffe des solanum. L. Daniel (*Compt. rend.*, 1920, **171,** 1074-6).—An early variety of potato was grafted on stocks of tomato or aubergine. The grafts mostly produced tubers on their aerial parts, and these were successfully cultivated the next year. Those tubers that came from the graft on tomato were all typical of the original potato, but many from the graft on aubergine showed modifications, and were very late instead of early. Some of these second-year plants continued to bear aerial tubers, as well as abundant subterranean ones, an interesting transmission of a character acquired by grafting.—F. F. B.

GROWTH OF LOWER PLANTS

2004. Influence de la nature de l'aliment carbone sur l'utilisation de l'azote par le Bacillus subtilis. E. Aubel (*Compt. rend.*, 1920, **171,** 478-80).—Cultures have been studied in which asparagin is the only source of carbon and of nitrogen, and compared with cultures containing respectively glycerol, glucose, or levulose in addition. The ammonia utilisation and the growth are much larger with these additions. Glycerol gives a ninefold increase, but this is believed to be due to the formation of pyruvic acid, which, given directly, has nearly twice the augmenting effect of glycerol. Levulose is not quite so good as glycerol, and glucose falls still further behind. The author concludes that carbon as =CO is most effective, then comes —CHO, and, finally, $—CH_2OH$. The superiority of ketone over aldehyde for constructive metabolism has been urged by many recent workers.—F. F. B.

2005. De la non-toxicité du cuivre pour les moisissures en général et pour le mildiou en particulier. G. Villedieu (*Compt. rend.*, 1920, **171,** 737-9).—The author shows that it is not the element Cu which is the active anti-infection agent in spraying mixtures for vegetation. Everything depends on the acidity or basicity of the radicles Cu is

combined with, and neutralisation removes the toxic effect. Many fungi will develop in a medium containing 10% of certain copper salts.—F. F. B.

2006. Influence des radiations lumineuses sur un fixateur d'azote. E. Kayser (*Compt. rend.*, 1920, **171,** 969-71).—The effects of different coloured glass screens were studied on the nitrogen-fixing activity of azobacter agile in culture media of mannite or glucose and salts. After 4 months in a north window the mannite was completely gone in black, yellow, and green cultures. White and violet glass gave the least destruction, red and blue were intermediate. The amount of nitrogen fixed was also determined; yellow gave the maximum (18 mg.), violet the minimum (11 mg.), the others intermediate values. The amount of N_2 fixed per grm. of mannite destroyed was, however, highest in violet, and low in yellow; but lower still in darkness. With glucose cultures green gives highest and white light the lowest total effect, and the efficiencies are again reversed. Into the interpretation of these relations, many factors of age and rate of development of the culture enter.—F. F. B.

2007. Heterothallism and Similar Phenomena. E. M. Cutting (*New Phyt.*, 1921, **20,** 10-16).—A review of recent work.—W. S.

2008. The Nutritional Requirements of Yeast. III. The Synthesis of Water-Soluble B by Yeast. E. V. Nelson, E. I. Fulmer, and R. Cessna (*J. Biol. Chem.*, 1921, **46,** 77-81).—Evidence is presented which shows that yeast can synthesise water-soluble B.—G. E. B.

2009. Vitamins and Yeast Growth. R. J. Williams (*J. Biol. Chem.*, 1921, **46,** 113-18).—Bakers' yeast by the yeast method shows much higher vitamin content than brewers' yeast, but by animal feeding experiments brewers' is much better. That there is some specificity in growth stimulants is indicated by the fact that bakers' yeast is richer than brewers' as regards the growth of bakers' yeast, whilst the reverse relation holds for brewers' yeast. The possibility that vitamin C may stimulate yeast growth is suggested by some results.—G. E. B.

ASSIMILATION

2010. Action sur la chlorophylle des radiations de différentes longueurs d'onde. R. Wurmser (*Compt. rend.*, 1920, **170,** 1610-2).—The rate of bleaching of chlorophyll has been quantitatively compared in the red, green, and blue spectral regions. The absorbed energy in the 3 regions is measured by a thermopile. It is concluded that for equal absorbed energy, red and blue are equally active in the photochemical bleaching. With changing wave length, the photochemical sensitivity and the absorption coefficient move in similar motion.—F. F. B.

2011. L'action des radiations de différentes longueurs d'onde sur l'assimilation chlorophyllienne. R. Wurmser (*Compt. rend.*, 1920, **171,** 820-2).—The rate of assimilation by green and red marine algæ has been studied behind the same screens as in the previous abstract. The intensity of the incident light was measured by its rate of destruction of a chlorophyll solution, the absorbed energy by the spectrophotometer, and the rate of assimilation by the indicator changes in sea-water. The green alga shows a secondary maximum in the blue, while for the red alga this is in the green. For equal amounts of absorbed energy it is stated that photosynthetic activity is greatest in green light, where absorption is least. This is explained as due to the same energy being distributed over a greater depth and active mass of protoplasm when absorption is feeble.—F. F. B.

2012. Sur la photosynthèse chez les algues floridées. R. Wurmser and J. Duclaux (*Compt. rend.*, 1920, **171,** 1231-3.)—Individual red marine algæ growing near the surface are often greenish and less red than deep-growing individuals. The photosynthesis of these greener forms is only $\frac{1}{3}$ that of the full red forms. Careful estimation of the chlorophyll pigments shows that the greener contain only $\frac{1}{2}$ to $\frac{1}{4}$ as much chlorophyll as

the red. There has been destruction of the red phycoerythrin in the stronger light habitat, and the production of chlorophyll has been lowered in relation to this. The author analogises this destruction of red pigment with the disappearance of retinal purple in the eyes of day forms as contrasted with night forms. The amount of carotin and xanthophyll is the same in deep and superficial forms.—F. F. B.

2013. Recherches sur l'assimilation du gaz carbonique par les plantes vertes. P. Mazé (*Compt. rend.*, 1920, **171,** 1391-3).—The volatile organic bodies that occur in green leaves in active assimilation have been studied by distilling them off at once, without added water, at 60° C. *in vacuo.* All leaves give evidence of ethyl alcohol, acetic aldehyd, and nitrous acid, but none gave formaldehyde. The following organic compounds were identified with certain leaves when assimilation is very active: CH_3—CHOH—CO—CH_3; CH_2OH—CHO; CH_3—CHOH—CHO. These are regarded as products of condensation in the synthesis of sugar, and they are identical with the products of break-down of sugar in various fermentations. Lemoyne's delicate test for diacetyl, prepared by oxidation of CH_3—CHOH—CO—CH_3, allows it to be proved with Phaseolus leaves that this body increases in amount hour by hour during active assimilation, but is quite absent on dull days.—F. F. B.

RESPIRATION

2014. Sur les échanges gazeux de la racine avec l'atmosphere. R. Cerighelli (*Compt. rend.*, 1920, **171,** 575-8).—The CO_2 production and O_2 absorption are measured for whole root systems in closed glass vessels, which may contain wet pumice or only damp air. When the root is still in union with its shoot system, and water is being absorbed from the wet pumice, a great deal of CO_2 is carried up to the shoot, so that much less CO_2 appears in the vessel than O_2 absorbed. When the shoot is cut through, the normal CO_2/O_2 relations are established for the root system alone. If the air round the root system is too dry, in the absence of pumice, the respiration is much reduced, but CO_2/O_2 relation is not altered.—F. F. B.

IRRITABILITY AND MOVEMENT

2015. L'orientation des rameaux dans l'espace. H. Ricôme (*Compt. rend.*, 1920, **171,** 734-5).—The author proposes to correlate the different orientation responses of primary, secondary, and tertiary branches to gravity when forming part of a whole branch system, with differences in their water-supply. The branches of highest order have least excess of water, and so enough is not available to carry out the growth changes that tissue tensions tend to produce when directively acted upon by gravity.—F. F. B.

2016. The Theory of Geotropic Response. V. H. Blackman (*New Phyt.*, 1921, **20,** 38-42).—Destructive criticism of Small's theory of geotropic response. It is shown that any rise of particles forming the disperse phase of protoplasm under the action of gravity must be negligible, and that the differences of concentration so produced could not produce the marked electrical effects required by Small's theory. The time required for such "creaming" to take place is tremendously longer than that required for geoperception. If such a current as that hypothesised by Small were produced, it should soon disappear when the creaming is complete, and the organ should therefore cease to react to gravity, which is not the case.—W. S.

ENVIRONMENTAL FACTORS

2017. On Adaptations of Foliage Leaves. S. Mágocsy-Dietz (*Math. és Természettudom. Erdesitö*, 1920, 273-308; in Hungarian.)—The author observed 27 different forms of leaf in *Convolvulus arvensis ;* these are arranged into 4 types. The variations

depend particularly on environmental factors. Auriculate or lanceolate develop in dryness and sunshine (herophile type), hastate in the shade (sciophile or xeliophile type), sagittate in strong light (heliophile type), particularly where the substratum possesses a variable humidity. These 3 types are connected with intermediate forms. Elliptical leaves are produced in diffuse light, fairly moist air, and moist soil (sciophile or hygrophile type). This type is constant, and is thought to approach the original form, for the primary leaves of Convolvulus always appear in this form.—W. S. (*Ber. ü. d. ges. Physiol.*).

THE SOIL

2018. Field Experiments on the Availability of Nitrogenous Fertilisers, 1908-1917. J. G. Lipman and A. W. Blair (*Soil Science*, 1920, **9**, 371-92).—The supply of nitrogen and carbon has been best maintained on those plots which have received farm manure. —C. W.

2019. The Relation of Sulphur to Soil Acidity and to the Control of Potato Scab. W. H. Martin (*Soil Science*, 1920, **9**, 393-408).—In all cases, following applications of sulphur, there was an increase in soil acidity as measured by the hydrogen-ion concentration of soil extracts.—C. W.

2020. Effect of Various Soluble Salts and Lime on Evaporation, Capillary Rise, and Distribution of Water in Some Agricultural Soils. M. I. Wolkoff (*Soil Science*, 1920, **9**, 409-36).—The author's experimental results indicate that (1) soluble salts materially decrease the evaporation of soil moisture; (2) there is a direct dependence of the efficiency of salts in decreasing the water evaporation upon the osmotic concentration of the soil solution in the surface inch of soil; (3) sodium chloride decreases the capillary rise of water; and (4) soil treated with potassium phosphate or calcium oxide, even in the surface inch, contained more water than the untreated soil, and yet evaporation from treated soil was decreased.—C. W.

2021. The Effect of Gypsum on Bacterial Activities in Soils. T. M. Singh (*Soil Science*, 1920, **9**, 437-68).—Ammonification and nitrification were decreased by the application to the soil of gypsum alone, but the acidity of the soil was increased. The nitrogen content of the soil was not markedly affected by the application of gypsum.—C. W.

2022. The Water-Supplying Power of the Soil as Related to the Wilting of Plants. B. E. Livingston and R. Koketsu (*Soil Science*, 1920, **9**, 469-85).—Reports a preliminary study of soil moisture conditions considered from a dynamic point of view, as these are related to the wilting of plants of *Coleus blumei* and of *Triticum sativum*.—C. W.

2023. Carriers of Nitrogen in Fertilisers. C. E. Thorne (*Soil Science*, 1920, **9**, 487-94.)—Results of tests indicate that nitrate of soda is the most effective carrier of nitrogen and produces the largest yield.—C. W.

PATHOLOGY

2024. Sur la résistance des plantules à l'inanition. H. Coupin (*Compt. rend.*, 1920, **171**, 550-1).—This note records the approximate duration of life in seedlings allowed to grow in complete darkness. Seventeen species were tried, and the times vary from 60 days for Pinus to 15 days for Lucerne.—F. F. B.

2025. A Graft Infectious Disease of Datura resembling a Vegetative Mutation. A. F. Blakeslee (*J. Gen.*, 1921, **11**, 18-36).—The disease, which has definite characteristics, is carried by seed and pollen, but is not transmitted by contact or inoculation. Although grafting communicates the infection, vegetative function is not obviously impaired, as in the case of chlorotic plants. The diseased plants are known as the Quercina type.—G. E. B.

BOOK REVIEWS

A Practical Course of General Physiology. By D. Noël Paton and W. F. Shanks. Fifth Edition. 1921. **A Practical Course of Chemical Physiology.** By D. Noël Paton, E. P. Cathcart, and D. Burns. Fifth Edition. 1920. **Guide to the Practical Study of Histology.** By D. Noël Paton and A. Watson. Fifth Edition. 1920. Glasgow: Maclehose, Jackson and Co. Prices and pages respectively, 2s. 6d., pp. 58; 2s., pp. 44; 2s., pp. 32.

New editions of these useful class books, the first of which has been completely revised. A former edition was reviewed on p. 498, Vol. III.—C. L. E.

Practicum der physikalischen Chemie insgesondere der Kolloidchemie für Mediziner und Biologen. By L. Michaelis. Berlin: Julius Springer, 1921. Pp. 160. Price M. 26.

An excellent introduction to the problems of colloid chemistry. It is written clearly, and the experiments are well selected.—H. W.

Studies in Deficiency Disease. By Robert M'Carrison. 1921. London: Henry Frowde and Hodder and Stoughton (Oxford Medical Publications). Pp. xvi+270, with 82 illustrations. Price 30s.

A noteworthy book. For full review see *Brit. Med. J.*, Júne 18, 1921.—W. D. H.

H. K. LEWIS & CO., LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

2026. Recherches sur la présence dans les météorites, les pierres dures, les minerais, le quartz, le granite, le basalte, les cendres et les laves volcaniques, d'organites susceptibles de reviviscence et sur leur résistance aux hautes températures. V. Galippe and Mme. G. Souffland (*Compt. rend.*, 1921, **172,** 1252-4).—Experiments have been carried out on the minerals enumerated in the title similar to those previously carried out on fossils (see Abstract No. 3219, Vol. V., p. 515). The authors claim that all these substances contain spherical or other bodies, which still retain latent life in spite of the fact that their organic constituents have been entirely destroyed by high temperatures. They claim to have brought about revivification in the case of all the above-named materials.—J. A. M.

2027. Glochidia and the Factors underlying Encystment. L. B. Arey (*J. Exp. Zool.*, 1921, **33,** No. 2).—The attachment of the glochidia to the gills of fishes is dependent upon tactile stimulation, mediated through the hair cells of the mantle. Chemical activation, although efficient, is not operative in nature. The proliferation of gill tissue, to cover an attached glochidium and produce a cyst, is a reparative process which restores the continuity of the epithelium. Cyst formation is not initiated or controlled by any vital influence of the glochidium, for it can be imitated by applying tiny metallic clips to a gill filament. Some normal regulatory factor fails to manifest itself in experiments upon excised filaments; overgrowth then produces large, malformed cysts.—W. D. H. (*W. I.*).

2028. Über Oxydationskatalysen—I. L. Karczag (*Biochem. Zeit.*, 1921, **117,** 69-86).—Experiments on the catalysis of peroxide oxidation of dyes by ferrous, ferric, Ni, Mn, Co, and Pt salts. Details unsuited for abstraction.—C. L. E.

2029. Brownian Movement and Fibril Formation. J. O. W. Barratt (Proc. Physiol. Soc., *J. Physiol*, 1921, **55,** xxi-ii).—As a result of oscillatory movement, suspended particles, if composed of viscous material and possessing the property of adhering to a surface, may be expected to undergo processes involving change of form—fibril formation in gels. It becomes possible to form some idea of the size of the particles giving origin to fibrils, and to explain the effect on fibril formation of dilution of the hydrosols in which the fibrils appear.—J. A. C.

2030. The Depth of Penetration of Ultra-violet Light-ray Energy in the Embryo of the Tadpole. W. M. Baldwin (*Anat. Rec.*, 1921, **21,** No. 3).—Ultra-violet light-ray energy varying in wave-length from 214·4 to 240·5μ has a penetrative capacity of but 0·02 mm. in the embryo of the tadpole. All of the energy, in other words, is absorbed by two layers of ectodermal cells of embryos at the time of closure of the neural tube. The energy produces an intracellular reaction characterised by an absence of vascular phenomena of inflammation, by spherulation of cells, and sluggishness of repair unaccompanied by extrusion or exfoliation.—W. D. H. (*W. I.*).

2031. Importance of the Infinitely Little. W. D. Halliburton (*Proc. Roy. Soc. Med.*, 1921, **14,** Sect. of Electrother., 27-39).—See Abstract No. 691, Vol. VI., p. 107.—W. D. H.

METHODS

2032. Graphic Study of Heart Murmurs. H. B. Williams (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 179-81).—An electro-magnetic telephone, provided with an air-damped diaphragm of high natural period, converts the sound vibrations into electrical oscillations. The currents produced by the telephone are amplified without distortion by a suitable instrument. The recording instrument is a string galvanometer. A condenser is so placed in the circuit that it acts as a selective sound filter. By this apparatus murmurs are rendered better than by the microphone; and, the disturbances due to undamped motion of diaphragm and carbon particles being absent, the murmur records look less complicated.—D. H. de S.

2033. Apparatus for Studying the Factors influencing Fish Migration. F. E. Chidester (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 175-7).—The apparatus is figured and described, and is shown to satisfy the requirements necessary for such observations.—D. H. de S.

2034. Tapis roulant pour l'étude de la marche et du travail. J. P. Langlois (*Compt. rend.*, 1921, **172,** 1447-9).—The moving surface is an improvement on one constructed by Benedict. It can be driven at various speeds, and set at various gradients. A description of the mechanism is given.—J. A. M.

2035. Endoscopie chez le cheval. G. Spitz (*Arch. da Escola sup. de agric. e med. vet.*, Rio de Janeiro, 1920, **4,** 77-83).—Description with figures of a laryngoscope and pharyngoscope for use in horses. The author foresees they will prove useful in veterinary science.—W. D. H.

2036. Barcroft's Differential Blood-Gas Apparatus. T. R. Parsons (*Biochem. J.*, 1921, **15,** 202-8).—The apparatus examined was the 1914 apparatus; details of suggested alterations in technique and the mathematical treatment of estimations must be read in the original.—W. D. H.

2037. A Simple Instrument for the Determination of the Refractive Indices of Liquids. W. A. M. Smart and F. A. Hocking (*Pharm. J.*, 1921, **106,** 286-8).—An inexpensive device for controlling the purity of essential oils and for other purposes.—H. E. R.

2038. New Immersion Fluid. V. Jensen (*Brit. J. Exp. Pathol.*, 1921, **2,** 155-6).—A mixture of liquid paraffin and *a*-bromnaphthalene adjusted to a refractive index of 1·515 is recommended for use with immersion lenses.—W. D. H.

2039. Handling Small Objects in Making Microscopic Preparations. C. W. Metz (*Anat. Rec.*, 1921, **21,** No. 4).—In preparing very small objects it was found convenient to use the skin surrounding the abdomen of Drosophila pupæ inside the pupa case. It is a thin, transparent bag, in which the objects may be packed. Various sizes may be secured by using pupæ of different species, all easily obtained.—W. D. H. (*W. I.*).

2040. Blood-Plasma for Embedding or Dissection of Small Organisms. G. A. Baitsell (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 172-3).—The organism is introduced into the liquid plasma, which is then allowed to clot. The clot containing the organism can be treated like an ordinary piece of tissue and embedded in paraffin in the usual way. Blood-plasma clot has also been found useful for holding small animals firmly in a certain position so that they can be dissected.—D. H. de S.

CHEMICAL

2041. The Physiological Zero: An Explanation of the Departure from the Linear Graph of the Reaction Rate Values at the Lower Temperatures. J. Krafka, Jr. (*J. Gen. Physiol.*, 1921, **3,** 659-61).—These deviations can be satisfied by a curve of the form

$y \sim A^x - Ba^n$, where A is Van't Hoff's constant, B and n are calculated values to represent the divergence between linear and exponential curves at uppermost points.—W. M. B.

2042. Donnan Equilibrium and the Physical Properties of Proteins. I. Membrane Potentials. II. Osmotic Pressure. J. Loeb (*J. Gen. Physiol.*, 1921, **3**, 667-714).—A neutral salt depresses the potential difference between gelatin chloride in a collodion bag and an aqueous external solution. The effect is similar to that of the same salt on the osmotic pressure. It can be calculated on the logarithmic formula of Nernst, on the assumption that the difference is due to unequal distribution of H-ions and to membrane equilibrium. A similar statement applies to the potential difference between a block of gelatin chloride and an aqueous solution. The influence of the H-ion concentration on the potential difference is similar to that on osmotic pressure —swelling and viscosity. It can be calculated as above. It can also be calculated from Cl-ion measurements. The equation $x^2 = y(y+z)$ expresses the equilibrium, when x is the concentration of H-ion or univalent anion in the water; y, that of the H-ion and univalent ion of acid in gelatin solution; and z, that of the anion combined with protein. The effect of H-ion on osmotic pressure can also be calculated on the basis of unequal distribution of diffusible ions. The valency effect described in previous papers can be calculated on the assumption that it is due to the influence of the valency of the anion on the relative distribution of free acid. There are two minor deviations from congruency between the curves of observed and calculated osmotic pressure.—W. M. B.

2043. Catalysis. VII. Temperature Coefficient of Physiological Processes. N. R. Dhar (*Proc. d. königl. Akad. d. Wiss., Amsterdam*, 1920, **23**, 44-9).—In homogeneous systems the temperature coefficient of the rate of reaction varies directly with the actual rate and order of the reaction. In heterogeneous systems diffusion is the chief factor determining the rate of change. Increase of temperature produces a twofold effect on biological processes—it tends to hurry chemical reactions, Brownian movement, and diffusion, but exerts a harmful effect on the living cell.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2044. Opacity of Liquids. (1) Methods; (2) Of Suspensions of Red Cells; (3) Of Calcium Oxalate Suspensions; (4) Of Diluted Serum. J. Holker (*Biochem. J.*, 216, 226, 232, 238-43).—(1) The methods of estimation used for determination of opacity must be read in the original, with the diagrams. (2) Endosmosis and exosmosis can be measured by the method, and the isotonic point determined with accuracy; the number of corpuscles can be also estimated; formulæ are set out. In conditions where surface action is predominant, opacity determinations offer a stricter measure of the change than number of particles. (3) Used for this purpose, special attention is called to the lag before turbidity appears when potassium oxalate and $CaCl_2$ are mixed. Excess of either oxalate or Ca ions increases the opacity. (4) When serum is diluted hydrolysis of its protein salts takes place, and the particles scattering light are thus increased. Details are given when the dilution is performed with water and saline solutions. The importance of this in relation to agglutination and Wassermann tests is discussed.—W. D. H.

2045. Analyse élémentaire microchemique du fer organique. M. Nicloux and G. Welter (*Bull. de la soc. chim. biol.*, 1921, **3**, 170-3).—A gravimetric method for the estimation of organic iron after ashing is described. If calcination is carried out in the presence of O_2, Fe_2O_3 is formed; the crucible is weighed, hydrogen passed through, reducing the oxide to metallic Fe; the loss of weight is a measure of the iron originally present. Results are given for oxyhæmoglobin (Fe, 0·42%) and hæmin (Fe, 8·73%).—E. P.

2046. Über die Bestimmung kleinster Arsenmengen. L. Ramberg and F. Pregl (*Zeit. physiol. Chem.*, 1921, **114,** 262-74).—Polemical on a question of priority.—H. W. D.

2047. Inversion and Estimation of Cane Sugar. A. R. Rose (*J. Biol. Chem*, 1921, **46,** 529-35).—Picric acid can be used for the hydrolysis of cane sugar, and the products of hydrolysis can be estimated colorimetrically by reduction of the picric acid. The products of hydrolysis may be estimated by the polarimeter.—H. E. R.

2048. Polysaccharides. VII. Constitution of Cellobiose. P. Karrer and F. Widmer (*Helv. Chim. Acta*, 1921, **4,** 295-7).—Purely chemical; cellobiose is 5-*β*-*d*-glucosido-*d*-glucose. (Compare Abstract No. 1644, Vol. VI., p. 238.)—W. D. H.

2049. Cholesterindibromid. I. Lifschütz (*Zeit. physiol. Chem.*, 1921, **114,** 286-9).—Cholesterol dibromide, prepared by bromination in ethereal solution, has a melting-point of 93° to 94° C., whereas Windaus, on mixing an ethereal solution of cholesterol with bromine dissolved in glacial acetic acid, obtained a product melting at 122° C. The author suspects that W.'s substance may be a compound of the dibromide with acetic acid.—H. W. D.

2050. Observations on Abnormal Iodine Values with Reference to the Sterols and Resins. Ida S. MacLean and E. M. Thomas (*Biochem. J.*, 1921, **15,** 319-33).—A study of the iodine values of various compounds when determined by both Wijs' and Hübl's methods. Possibly the former acid reagent causes enolisation prior to halogenation, whereas this reaction is induced only slowly by the neutral Hübl method. The original must be consulted for details.—J. A. H.

2051. On the Unsaponifiable Matter of the Ether Extract of Human Fæces. J. A. Gardner (*Biochem. J.*, 1921, **15,** 244-73).—The substance (or substances) discussed belong to the sterol or polyterpene group. The paper is purely chemical.—J. A. H.

2052. Casein Viscosity. H. F. Zoller (*J. Gen. Physiol.*, 1921, **3,** 635-51).—The maximum viscosity in hydroxides of Na, K, Li, and NH_4 occurs at P_H9·1 to 9·25. It is greatest in ammonia. In solutions of 8 to 10% casein, the maximum viscosity is when 98×10^{-5} gm. equivalents of base are combined with 1 gm. of casein. The same P_H as above gives maximum viscosity in solutions of Na_2CO_3, Na_3AsO_4, Na_2SO_3, NaF, and Na_2PO_4. It is at 8·15 to 8·2 in the case of borax. The cause of the decline with increase of H-ion beyond the maximum is the hydrolytic splitting of casein into a protein containing no S or P, and less N. When casein has been heated in the course of preparation, it gives solutions of high viscosity in alkalis.—W. M. B.

2053. Protein Racemisation. H. E. Woodman (*Biochem. J.*, 1921, **15,** 187-201).—The method used is a simple modification of the observation on optical activity, which falls when a protein is treated with dilute alkali. Proteins which give the same curve are presumably identical; different proteins give different curves. Using this method, the identity of the following pairs of proteins was established: euglobulin and pseudo-globulin of serum or of colostrum; the globulins of cow and ox serum with those of colostrum; the albumin of milk and of colostrum. Globulin is a definite individual. Lactalbumin and serum albumin are two distinct proteins. Mammary synthesis is necessary for both caseinogen and lactalbumin.—W. D. H.

2054. Über die Nucleinsäuren der Rindermilz. H. Steudel (*Zeit. physiol. Chem.*, 1921, **114,** 255-61).—As in the case of the pancreas, so also from the spleen, guanylic and nucleic acids are obtained. In the nucleo-proteins from both organs guanylic acid apparently is not the only nucleic acid constituent present.—H. W. D.

2055. Emploi du chloroforme pour la préparation de nucléo-protéides et d'acides nucléiques actifs in vitro sur le sang. Complexité de l'action des acides nucléiques in vitro. Doyon (*Compt. rend.*, 1921, **172,** 1212-4).—To obtain active nucleic acid, the thymus is submitted to autolysis in the presence of chloroform, and the acid is then

extracted by Neumann's method. All nucleic acids inhibit coagulation of blood *in vitro*. When injected into the blood-stream, their action is more complex, in that they excite the secretion, probably by the liver, of a nucleo-protein which has anti-coagulant properties.—J. A. M.

2056. Über die Darstellung von Chlor- und Bromtyrosin und von den analogen Tyraminen. R. Zeynek (*Zeit. physiol. Chem.*, 1921, **114,** 275-85).—Tyrosine is suspended in glacial acetic acid, and to it is added a solution of bromine in the same solvent; 3·5 dibromotyrosine is formed in excellent yield; 3·5 dichlorotyrosine and the analogous tyramines are obtainable by the same method.—H. W. D.

2057. A Cheap Source for Glutamic Acid. C. L. A. Schmidt and G. L. Foster (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 205-6).—The glutamic acid is prepared from Ajinomoto, a Japanese commercial preparation of sodium glutamate.—D. H. de S.

2058. The Reaction of Taurine with a-Naphthyl-isocyanate. C. L. A. Schmidt (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 204-5).—Taurine reacts with *a*-naphthyl-isocyanate to form the corresponding hydantoic acid. The Ba salt of this was precipitated by addition of $BaCl_2$. From the washed and dried precipitate, the elementary composition of the Ba salt was determined.—D. H. de S.

2059. Latency Time in Enzyme Determinations. G. M. L. Baas-Becking (*J. Gen. Physiol.*, 1921, **3,** 653-6).—Certain cases in which the ordinary unimolecular law gives increasing values of the constant may be explained by the existence of a latent period before any action commences. This is probably due to preliminary adsorption. The time must be reckoned from the actual beginning of the reaction.—W. M. B.

2060. Über die Natur diastatischer Fermente. W. Biedermann (*Münch. med. Woch.*, 1921, **68,** 692-3).—A suggestion that the diastatic ferment of saliva may be of the character of an albumose.—J. H. B.

2061. Über Gärung ohne Hefe. E. Baur and E. Herzfeld (*Biochem. Zeit.*, 1921, **117,** 96-112).—Mixtures of substances imitating yeast press juice (*e.g.*, peptone, glucose, $NaHCO_3$, casein, lipoid, and bile salts) fermented and produced alcohol. Toluene was used as an antiseptic, but did not ensure sterility.—C. L. E.

PHYSIOLOGY OF INVERTEBRATES

2062. The Food Reactions of the Infusorian Spathidium spathula. L. L. Woodruff and H. Spencer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 183-4).—This infusorian seems to liberate from its oral region a specific substance which paralyses and kills small ciliates, chiefly species of *Colpidium*. If the *Colpidium* happens to remain against the truncated anterior end of the *Spathidium*, the latter forces its prey through its slit-like mouth into the interior of the cell. If the *Colpidium* is removed from the oral region of its captor, the latter goes through a series of reactions by which its anterior end is eventually brought in contact with the *Colpidium*. The factors involved may be products derived from the dead *Colpidium*, but more probably are directly related to the poisonous secretion liberated by *Spathidium* itself. In any case, the complex series of reactions exhibited by *Spathidium* afford, it is believed, a remarkable example of sensing at a distance by a unicellular organism.—D. H. de S.

2063. Die experimentelle Erzeugung von Hüllen bei Infusorien als Parallele zur Membranbildung bei der künstlichen Parthenogenese. E. Bresslau (*Naturwiss.*, 1921, **9,** 57-62).—A description of the membranes thrown off from the surface of ciliates—chiefly *Colpidium colpoda*—under the influence of the various chemical agencies which also lead to membrane formation when employed to induce the parthenogenetic development of eggs.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2064. Respiratory Exchange in Small Aquatic Organisms, with Reference to the Use of Flagellates as an Indicator for Oxygen Consumption. H. M. Fox (*J. Gen. Physiol.*, 1921, **3,** 565-73).—The positive chemotaxis of flagellates for oxygen is at its optimum at an oxygen tension lower than that in the atmosphere. Hence, they aggregate to those parts of an aquatic animal which are absorbing oxygen and in proportion to the activity of such parts. The red *Chironomus* larva respires by the whole surface, except the head and "ventral gills." When held motionless in an indicator which is sensitive about the neutral point, the relative amounts of CO_2 given off can be detected. It was found that the parts absorbing oxygen are identical with those giving off CO_2.—W. M. B.

2065. Life-History of an Amicronucleate Race of Didinium nasutum. M. W. Patten (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 188-9).—Amicronucleate individuals are viable, but unable to undergo processes such as encystment, conjugation, and endomixis, which are dependent largely upon micronuclear activity.—D. H. de S.

2066. The Vitality of Actinia bermudensis. A Study in Symbiosis. J. F. Fulton, Jr. (*J. Exp. Zool.*, 1921, **33,** No. 2).—The work was carried out to determine whether the association between *A. bermudensis* and the Zooxanthellæ which it contains is one of true symbiosis. *A. bermudensis* possesses a remarkable resistance to unfavourable environment; it was suspected that this might be due to the occurrence of the chlorophyll-containing organisms within its tissues. Sealed in a jar containing 100 c.c. of sea-water, the actinian will live for 6 days, in O_2 for 7 days, and in air for 7 days. It was found that when placed in darkness (in which, as a result, the algal symbionts could not act) the anemone could live equally long. This indicates that the Zooxanthellæ are not true symbionts, and the association is one of obligate parasitism, the actinian being parasitic upon the Zooxanthellæ.—W. D. H. (*W. I.*).

2067. The Substances needed for the Growth of a Pure Culture of Colpidium colpoda. R. A. Peters (*J. Physiol.*, 1921, **55,** 1-32).—Pure cultures of this ciliate protozoon in synthetic media have been obtained from a single individual and studied for a year. Upon a medium consisting of glass-distilled water, $CaCl_2$, KCl, NaCl, $MgSO_4$, and ammonium glycerophosphate, test-tube cultures have been kept going by frequent subculture without diminution in the size of the organisms; this protozoon does not require bacteria as part of its food. Increase in protoplasm and cell division are 2 factors capable of being dissociated. The ammonium, phosphate, and chloride constituents of the medium could not be omitted without stopping growth. The omission of K and Mg in glass-tube cultures was without effect, but in quartz-tube cultures K deficiency led to death, while Mg deficiency inhibited growth. The biological value of K is not solely a question of radio-activity in the growth process, since uranium salts cannot be substituted for K. In its K requirements this protozoon resembles the algæ moulds and bacteria. Growth has not been demonstrated on carbon sources containing less than 3 carbon atoms in the molecule. Whilst lactate alone did not give growth, and glucose alone gave variable but poor growth, glucose and lactate gave remarkable growth, better than the growth in the standard glycerophosphate mixture. —J. A. C.

2068. The Changes produced by Radium Rays and Ultra-violet Light in the Egg of Nereis. A. C. Redfield and Elizabeth M. Bright (*J. Physiol.*, 1921, **55,** 60-85).—α-rays and ultra-violet light resemble β- and γ-rays in altering the process of membrane formation and jelly secretion in Nereis eggs, but the process is unaffected by wave-lengths of light shorter than 3,000 Å.U. The changes consist of a reduction in the volume of the jelly formed outside the egg, and an increase in the volume of the perivitelline space; in short, a certain quantity of the jelly substance is retained within the perivitelline space of the egg, this being caused by an alteration in the physical

properties of the jelly substance. The changes are limited to the exposed side of the egg in the case of α-rays and ultra-violet light, whereas in the case of β- and γ-rays the changes are uniformly distributed, owing to differences in the penetrating power of these radiations; the failure of visible light to affect the egg is attributable to the limited absorption of those wave-lengths by protoplasm. Since the change produced in the egg is simple in nature, it is justifiable to suspect that some common mechanism underlies the effects produced by these different radiations.—J. A. C.

2069. Dynamics of Morphogenesis. XI. Physiological Factors in the Development of the Planarian Head. C. M. Child (*J. Exp. Zool.*, 1921, **33**, No. 2).—The different forms of head observed in the reconstruction of pieces of *P. dorotocephala* fall into two groups. The series, normal to acephalic, represents a series of differential inhibitions of development, the degree of inhibition being greatest in the median region and decreasing laterally. Under certain conditions, secondary changes in head form, opposite in direction, may occur. These result from differential acclimation to or recovery from the action of an inhibiting factor. The development may be controlled experimentally, both through external physical and chemical factors and internal physiological factors. The different head forms are determined, not by specific action of particular agents or conditions on the protoplasm, but by change in the physiological condition of the protoplasm, which is primarily quantitative. The regional differential action of physical and chemical agents results from the presence of the physiological gradients in the protoplasm. In the absence of such gradients a graded series of differentially inhibited head forms, ranging from normal to acephalic, would be impossible. Presence or absence of particular organs in these heads—*e.g.*, the eyes—does not mean presence or absence of the hereditary factors or potentialities concerned, but merely the existence of differences, primarily quantitative, in the conditions concerned in the realisation of the hereditary potentialities.—W. D. H. (*W. I.*).

2070. Constituents of the Japanese Earth-Worm. Y. Murayama and S. Aoyama (*J. Pharm. Soc. Japan*, 1921, 221-40).—Dried earth-worm (*Lumbricus spenceri*), used as an antipyretic, was powdered and extracted with cold ether. The syrup (2·3%) left on evaporation contained free acids, esters, and 31·2% of unsaponifiable matter. The acids, both free and as esters, were stearic and palmitic acids, together with a mixture of highly unsaturated fatty acids, from which bromine compounds were prepared. The unsaponifiable matter on hydrolysis with alcoholic KOH yielded cholesterol. The residue contained a lipoid (P 3·96%), and a mixture of amino-acids, from which leucine, tyrosine, and valine were isolated.—W. D. H. (*J. C. Soc.*).

2071. The Power of Adhesion in the Suckers of Octopus bimaculatus. G. H. Parker (*J. Exp. Zool.*, 1921, **33**, No. 2).—The excised living suckers from the arms of the octopus, when electrically stimulated, can exert a pressure that varies from 45 to 70% of an atmosphere.—W. D. H. (*W. I.*).

2072. Anaerobic Respiration in Some Pelecypod Molluscs. The Relation of Anaerobic Respiration to Glycogen. C. Berkeley (*J. Biol. Chem.*, 1921, **46**, 579-98).—Production of CO_2 can occur in the absence of oxygen, but more CO_2 is produced in some species in a current of hydrogen than in a sealed vessel; in one species more CO_2 was produced in a current of hydrogen than under aerobic conditions. In one species glycogen disappeared during anaerobic metabolism. The amount of glycogen that disappeared corresponded to the complete breakdown of the glycogen into CO_2 and methane.—H. E. R.

2073. The Experimental Production of Twins and Double Monsters in the Larvæ of the Starfish Patiria miniata. H. H. Newman (*J. Exp. Zool.*, 1921, **33**, No. 2).—A series of twins and double monsters was produced under 3 experimental conditions: (*a*) as the result of belated parthenogenetic development; (*b*) as the result of fertilising

Patiria eggs with the sperm of another species of starfish; (*c*) as the result of overcrowding normally fertilised eggs. The common factors in all 3 are retardation of development, with loss of precise axiate organisation at some critical period; redifferentiation or resumption of axiate organisation, but unity of organisation has been lost, so that two or more axes or gradients appear instead of the original one. Thus twins or double structures arise. A series of twin types is produced which represent the results of differences in the earliness of onset of retardation and more or less complete recovery.—W. D. H. (*W. I.*).

2074. Zum Gehörsinne der Lepidopteren. H. Stauder (*Zeit. d. österr. Entomol. Ver. Wien.*, 1920, **5**, 70-1).—A shrill whistle causes Lampides to seek a quiet spot. This Saharan butterfly therefore possesses a sense of hearing.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2075. La segmentazione dell' novo fecondato del "Bombyx mori" sottoposto a svernamento artificiale subito dopo la deposizione. R. Grandori (*Ann. d. R. staz. bacol., Padova*, 1920, **43**, 19-43).—A study of the effects of exposure to cold and to electrical stimuli on the segmentation and survival of the deposited fertilised egg of the silkworm.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2076. Physiology of Silkworm. A. P. Jameson and W. R. G. Atkins (*Biochem. J.*, 1921, **15**, 209-12).—P_H in the *Bombyx mori* was for blood and silk-gland = 6·8, of the digestive secretion = 9 to 9·8, in the hind-gut = 8·4, in the moth's gut = 5·2 to 5·8. In the digestive secretion there are present diastase active in a strong alkaline medium, and maltase. A feeble maltase and a more active invertase are present in blood and hæmocœlic fluid. Oxidase is absent from both blood and digestive secretion, but catalase action is shown by both.—W. D. H.

2077. Biochemische Feststellung der Verwandtschaft bei Insekten. Collier (*Zeit. f. wiss. Insektenbiol.*, 1920, **16**, 1-5).—By cultivation of the tissues of insect larvæ *in vitro* it was found that cells from the same animal would unite to form secondary membranes; this occurred to a less extent with cells from different individuals of the same species, and not at all in the case of cells from individuals of different species. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

2078. Beiträge zur Frage nach dem Einfluss von Temperatur und Ernährung auf die quantitative Entwicklung von Süsswasserorganismen. H. Wundsch (*Zool. Jahrb., Abt. f. allg. Zool. u. Physiol.*, 1921, **38**, 1-48).—The temperature factor was found to be the more important.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

CELLS AND TISSUES

2079. The Phagocytosis of Solid Particles. III. Carbon and Quartz. Wallace O. Fenn (*J. Gen. Physiol.*, 1921, **3**, 575-93).—The rate of ingestion of carbon particles suspended in serum was found to be 4 times as great as that of quartz. The difference between the rates increases as the phagocytic activity decreases. The cause appears to be the greater instability of carbon suspensions. Application of the facts to bacterial agglutination and opsonins is discussed.—W. M. B.

2080. Les colorations intravitales et la réaction de l'oxydase. L. M. Betances (*Compt. rend soc. biol.*, 1921, **84**, 906-8).—A criticism of the deductions to be drawn from the results of *intra vitam* staining.—J. H. B.

2081. Sur les lipoïdes des leucocytes. E. Savini (*Arch. méd. belges*, 1921, **74**, 325-9). —A method of staining blood so as to show the lipoid content of the leucocytes is described. The main stain used was "Scharlach R." The lipoid in the granular leucocytes in the red cells, and even in non-granular leucocytes, may be demonstrated by this method.—E. P.

2082. Eine praktische Abänderung der Oxydasereaktion bei weissen Blutkörperchen. F. v. d. Zande (*Nederl. Maandschr. v. geneesk.*, 1920, **9**, 625-30).—Practical details of the method of demonstrating the oxidase reaction in blood-films.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2083. Les conséquences cytologiques de l'arrêt osmotique de la division cellulaire. J. Dragoiu and F. Vlès (*Compt. rend.*, 1921, **172**, 1210-1).—Details of the cytological examination of cells previously studied in the living condition (see Abstract No. 1669, Vol. VI., p. 241). The relation of the degree of pressure to the effect produced is discussed.—J. A. M.

2084. On an Autoxidisable Constituent of the Cell. F. G. Hopkins (*Biochem. J.*, 1921, **15**, 286-305).—The substance responsible for the nitro-prusside reaction in animal tissues has been isolated from yeast, from muscle, and from mammalian liver. It is a dipeptide containing glutamic acid and cystein, is present in from 0·01 to 0·02% in fresh tissue, and contains practically all the non-protein organic sulphur of the cell. It is autoxidisable, and, owing to changes in the sulphur group of the cystein unit from sulphydryl to disulphide condition (—SH HS— $\rightleftharpoons$ —S—S— H_2), it acts readily as a hydrogen acceptor or an oxygen acceptor. Probably it has actual functions in the animal cell.—J. A. H.

2085. Sur quelques attitudes fonctionelles du chondriome de la cellule hépatique. R. Noel (*Compt. rend.*, 1921, **172**, 1379-81).—A study of the mitochondria of the liver cell of the rat. Transition forms are described between mitochondria and secretory granules.—J. A. M.

2086. Cellules à granulations éosinophiles d'origine histioïde dans le sang circulant de l'embryon. L.-M. Bétances (*Compt. rend.*, 1921, **172**, 1381-2).—The author has found eosinophile polymorphonuclear cells in the circulating blood of a guinea-pig embryo of 27 mm. At this stage the bone-marrow is not developed. This observation confirms previous work bearing on the possible formation of eosinophile cells by direct differentiation of mesenchyme cells in the mouse.—J. A. M.

2087. Relationship between the Formation of Yolk and the Mitochondria and Golgi's Apparatus during Oögenesis. J. B. Gatenby. **Method for Demonstration of the Golgi Apparatus.** C. da Fano (*J. Roy. Micr. Soc.*, 1920, 129-56, 157-62).—Titles inserted for cytologists interested.—W. D. H.

2088. Sulla natura della cellula luteinica e della cellula interstiziale dell' ovario. E. Brugnatelli (*Fol. gynæcol.*, 1920, **13**, 111-20).—In a culture *in vitro* of a resting ovary only indifferent cells developed, whereas similar cultures of ovary from animals on heat showed the development of luteal cells.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2089. Genetical Behaviour of Heteromorphic Homologous Chromosomes of Circotettix (Orthoptera). E. Eleanor Carothers (*J. Morph.*, 1921, **35**, No. 2).—Title inserted for the sake of those interested in genetics and cytology.—W. D. H.

2090. Studi sulla curva di accrescimento della cellula gangliare del l'uomo. A. Busacca (*Gior. d. R. Accad. de med. di Torino*, 1920, **83**, 101).—These cells increase in size up to the 30th year, and then diminish.—J. A. H. (*Med. Sci.*).

2091. Physiologie und Pharmakologie des fibrillären Bindgewebes (Sehne). E. Friedberg (*Arch. exp. Path. Pharm.*, 1921, **89**, 66-105).—Determinations of the limits of elasticity of pieces of tendon, when cut out fresh, and after drying, heating, immersion in hypotonic and hypertonic solutions, acids, alkalis, etc.—J. H. B.

2092. Über die Zusammensetzung des Fettgewebes unter verschiedenen physiologischen und pathologischen Bedingungen. O. Schirmer (*Arch. exp. Path. Pharm.*, 1921, **89**, 263-79).—Human fat, from subjects in an average state of nutrition, has an iodine value of 66, with melting-point 18° to 20°. The quality of the food changes the composition of the fat; thus oil administration raises the iodine value; in this change

mesenteric fat and the fat of the kidney capsule take part as well as the subcutaneous fat. Corpulent individuals have a higher iodine value (70), and thin ones a lower (60), with a lower and higher melting-point respectively. Nephritis, diabetes, and, in animals, castration, appear to lower the iodine value. The fat of healthy individuals contains less water than that of wasted subjects.—J. H. B.

2093. Fausse et vraie myogénèse chez les Copépodes pélagiques. Erreur due à la méconnaissance de péridiniens parasites cœlomiques. E. Chatton (*Compt. rend.*, 1921, **172,** 1441-3).—In an elaborate memoir Moroff has described the formation of muscular tissue in certain marine Copepods. Chatton points out that the tissue observed by Moroff was in reality a parasite undergoing spore formation.—J. A. M.

2094. Déclanchement expérimental d'une onde cinétique par injection intrapéritonéale de sérum. A. P. Dustin (*C. r. de la soc. belge de biol.*, 1921, 23-4).—Chez la souris l'injection intrapéritonéale de 1 à 3 c.c. de sérum humain aseptique déclanche, après une période de latence de 3-4 jours, une période de cinèses de même durée, dans le thymus, la mœlle osseuse, la rate, les plaques de Peyer, les ganglions lymphatiques, etc. Le sérum chauffé pendant 30 min. à 56° garde cette propriété. La substance active parait être le produit de la digestion des protéines étrangères par les leucocytes.—E. Z.

2095. Influence du mode d'introduction, sous-cutané ou intrapéritonéal d'une albumine étrangère sur le déclanchement de l'onde de cinèses. A. P. Dustin (*C. r. de la soc. belge de biol.*, 1921, 25).—En injection sous-cutanée, le sérum humain frais provoque une réaction cinétogène moins intense et plus tardive qu'en injection intrapéritonéale.—E. Z.

MUSCLE

2096. The Regulation of the Supply of Energy in Muscular Contraction. W. Hartree and A. V. Hill (*J. Physiol.*, 1921, **55,** 133-58).—A study of the heat production during the first 3 phases of contraction—*i.e.*, excluding the recovery process (Abstract No. 2491, Vol. V., p. 392). For tetani of 0·017 second, frog's muscle produces the same heat at all temperatures; for shorter stimuli the heat production rises, while for longer ones it falls, with reduction in temperature. In prolonged maximal contraction, after the first sudden outburst of heat, the rate of heat production steadies down to a constant rate which has a temperature coefficient of 2·8 per 10° C. Similarly, H/T.l increases with duration of stimulus, finally becoming a linear function of the duration, and having a coefficient for increase by temperature of 2·3 per 10°. But for single shocks the ratio is independent of temperature. The heat produced in a contraction is equal to the sum of that which represents the energy expended in doing work and of that representing the maintenance of a force for the duration of the contraction. The area of an isometric tension-time curve is a linear function of the duration of the stimulus. Striated muscle has a very low efficiency in maintaining a constant force, especially at higher temperatures, though the efficiency in producing potential energy is high. The greater the duration of a single twitch, the greater the efficiency in maintaining a constant force. The mechanism associated with these various properties is speculated upon.—C. L. E.

2097. The Tetanic Nature of the Voluntary Contraction in Man. A. V. Hill (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** xiv-xvi).—By the use of a tambour and the hot-wire sphygmograph (Abstract No. 2591, Vol. V., p. 411) it is shown that the voluntary contraction of muscle is an incomplete tetanus compounded of about 50 oscillations per second. The fact that the rate is very uniform and that mutual extinction of vibrations does not take place, probably indicates that all the separate stimuli from

all the motor nerve cells are of the same frequency, and in phase with one another.—C. L. E.

2098. Muscular Contraction. III. The Influence of Extension and Temperature on the Heat Production in the Muscle Twitch. Y. Doi (*J. Physiol.*, 1921, **55,** 38-42).—In addition to confirming that heat production on isometric contraction is maximal at a certain moderate extension, it is shown that the optimal extension is less at a lower than at a higher temperature, while, except at extreme extensions, heat production is greater at lower temperatures. These results agree with those on the mechanical performance (Abstracts Nos. 3324, Vol. V., p. 528, and 1208, Vol. VI., p. 179).—C. L. E.

2099. De la dualité d'origine des courants électriques produits par les muscles striés. J. de Meyer (*Arch. intern. de physiol.*, 1921, **16,** 172-92).—En étudiant les électromyogrammes publiés dans un grand nombre de travaux par les auteurs, on peut aisément se convaincre que le courant d'action diphasique classique ne constitue pas la seule manifestation électrique des muscles. Il est suivi très souvent de courants très différents (courants de déformation) dont les premières phases interfèrent avec la fin du courant d'action. La présence ou l'absence de courants de déformation dépend du genre de travail exécuté par les muscles.—L. F.

2100. De la superposition des courants d'action et de déformation dans les muscles. J. de Meyer (*Arch. intern. de physiol.*, 1921, **16,** 192-227).—Dès que le muscle présente au cours de la contraction une modification de forme quelconque, il s'ajoute au courant d'action (C.A.) un courant que l'auteur appelle de déformation (C.D.). Le C.D. est toujours plus long que le C.A. Il peut consister en une ou peusieurs ondes qui interfèrent avec la fin du C.A. La charge, l'extension préalable, la liberté plus ou moins grande avec laquelle le muscle se déforme, etc., modifient l'allure du C.D.—L. F.

2101. Recherches chimiques et physico-chimiques sur les muscles et sur le suc musculaire. VI. Le suc des muscles d'octopus. VII. Les graisess, la cholestérine et les lipoïdes du suc des muscles striés de chien. G. Quagliariello (*Arch. intern. de physiol.*, 1921, **16,** 228-38, 239-50).—VI. On peut démontrer à l'ultramicroscope, dans le suc de presse des muscles des Céphalopodes, l'existence d'innombrables granules (de myosine), identiques à ceux que l'on observe dans les sucs des muscles striés et lisses des mammifères, mais s'agglutinant par la chaleur (soi-disant première coagulation thermique du suc musculaire) à une température beaucoup plus élevée que chez les mammifères. Ce fait avait conduit à nier erronément l'existence de la myosine chez les Céphalopodes. Ce retard dans l'agglutination par la chaleur des granules de myosine s'explique par la viscosité élevée des sucs de Céphalopodes. Les muscles de Céphalopodes rentrent donc sous ce rapport dans la règle générale. VII. Le suc des muscles striés du chien soumis à une centrifugation énergique et répétée ne contient plus de graisse visible au microscope ou séparable par centrifugation. Il contient cependant encore des quantités notables d'acides gras, de cholestérine et de phosphore lipoïde qui passent en majeure partie (90%) dans les granules de myosine, quand on sépare par dilution et chauffage à 45° les deux protéines du suc musculaire. En outre environ la moitié des acides gras de la myosine s'y trouvent sous forme de phospholipine. D'après Bottazzi et Quagliariello les granules de myosine dérivent des myofibrilles: celles-ci sont donc constituées en grande partie de substances lipoïdes.—L. F.

2102. Experimental Proof for the Active Dilatation of Cross-striated Muscle Tissue. J. Bramson (*Sitz d. königl. Akad. d. Wiss.*, Amsterdam, 1920, **23,** 111-4).—Experiments which show that a striated muscle relaxes actively after contraction.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2103. Effect of Low Temperatures on Amphibian Muscle. D. L. Foster and D. M. Moyle (*Biochem. J.*, 1921, **15,** 334-46).—Frog muscle kept at 0° in air or oxygen becomes non-irritable, but remains non-rigid; there is no survival production of lactic acid.

If kept in nitrogen, the muscle becomes rigid and opaque, and lactic acid is formed. Apart from survival lactic acid, the non-irritable muscle forms lactic acid similarly to fresh irritable muscle. Solutions isotonic to normal muscle are hypertonic to non-irritable muscle. The behaviour of the non-irritable muscle is not that of fatigued muscle. It gives no current of action on stimulation, but there is a demarcation current less than normal. The loss of activity is probably "ionic."—J. A. H.

2104. Die entwicklungsmechanische Bedeutung der Doppelbildungen nebst Untersuchungen über den Einfluss des Zentralnervensystems auf die quergestreifte Muskulatur des Embryo. H. E. Anders (*Arch. f. Entwicklungsmech. d. Org.*, 1921, **47,** 452-97).—In the first part the question of the significance of "doubling" in embryological development is discussed. In the second part it is shown that after the embryonic cross-striated muscle has become differentiated, it receives trophic impulses from the central nervous system. During the stages when the organs are being laid down regeneration of these occurs independently of the central nervous system; but in the stages of functional development the influence of the nervous system on the regenerative process is well marked.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2105. La chronaxie chez le nouveau-né. G. Banu, G. Bourguignon, and H. Laugier (*Compt. rend. soc. biol.*, 1921, **85,** 49-51).—The chronaxie of the muscles of new-born infants is 1·5 to 10 times greater than that of adults.—J. H. B.

2106. La chronaxie dans la dégénérescence Wallérienne neuromusculaire, chez l'homme. G. Bourguignon (*Compt. rend* , 1921, **172,** 1452-4).—When partial degeneration has occurred, the muscle may, according to the position at which it is stimulated, give either a rapid or a slow contraction. It has two chronaxies, that for the rapid contraction never more than 15 times the normal, that for the slow at least 50 times the normal. Galvanotonus has a chronaxie intermediate between that of the rapid and that of the slow contraction. When total degeneration has occurred, only the slow type of contraction can be excited. The author concludes that in the latter case there are only "slow" fibres present in the muscle, whereas in partial degeneration there are both "slow" and "rapid" fibres.—J. A. M.

NERVOUS SYSTEM

2107. Über den Einfluss des osmotischen Druckes auf die Erstickbarkeit des Kaltblüternerven. A. Gottschalk (*Zeit. f. all. Physiol.*, 1921, **19,** 80-90).—Treatment with hypotonic sodium chloride solution lengthened the time required for loss of conductivity of the frog's sciatic nerve when deprived of oxygen. The same solution did not affect the excitability. On the other hand, hypertonic sodium chloride solution diminished the time required for the loss of conductivity consequent upon exposure to pure nitrogen, and at the same time increased the excitability. These effects are said to be due, not to changes in concentration of specific electrolytes in the tissue, but to the effect of changes in the water content of the nerve fibres on the rate of their metabolic processes.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2108. Cultivation of Nerve Tissue. Nerve Regeneration. P. B. Henrikson (*Act. Chir. Scand.*, 1921, **53,** 265).—Histological. Following nerve section, regressive changes appear in the distal part of the central stump; the myelin sheath breaks down, and there is simultaneous co-extensive proliferation of neurilemmal nuclei. At the end of each nucleus a cap of protoplasm appears and forms an elongated fibril, thus producing fine nucleated protoplasmic strands, the most peripheral of which grow towards the cut end of the nerve along the sheath of Schwann, and finally form the bulk of the scar tissue uniting the cut ends of the nerve. This is the first stage of regeneration.

The second stage comprises the laying-down within each strand of the axis cylinder with its medullary sheath. The rudiments of the new nerve fibres grow from the ends of the nuclei, and, meeting similar outgrowths from adjacent nuclei, form at their junction the nodes of Ranvier. Below the section a similar regeneration ensues, slower and more diffuse. Waller's law is regarded as untenable. In studying this question, other observers have interpreted wrongly the staining reactions. Histologists, however, will probably disagree with the author. No cultivation experiments appear to have been made. Coloured illustrations are given; these are difficult to interpret.—J. A. H. (*Med. Sci.*).

2109. Action du chloral et du chloralose sur les fibres nerveuses. R. Legendre (*Compt. rend. soc. biol.*, 1921, **85,** 44-5).—In its action on the excitability of a nerve-muscle preparation, chloral has been shown, by a study of the changes in chronaxie, to act on nerve, while chloralose acts on muscle. Microscopic investigation confirms this. (Compare Chauchard, Abstract No. 1929, Vol. VI., p. 278.)—J. H. B.

2110. Über den Wischenreflex des Frosches. Ein Beitrag zur Analyse der Reflexfunktionen des Rückenmarks. K. Wachholder (*Zeit. f. allg. Physiol.*, 1921, **19,** 91-118).—A detailed account of the parts played by the several muscles of the hind-limb in the production of the wipe reflex in the spinal frog.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2111. Are the Superior Cervical Ganglia Indispensable to the Maintenance of Life? S. J. Meltzer (*Proc. Nat. Acad. Sci., U.S.A.*, 1920, **6,** 532-9).—After removal of the superior cervical ganglion, 90% of animals die within two days. The effect seems not to be on the œsophagus, or on the respiratory or vasomotor systems. It may be due to removal of some internal secretion from the ganglion; it does not follow section of the post-ganglionic fibres.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2112. Contribution à l'étude du métabolisme cérébral par la méthode des circulations partielles. IV. Sécrétion interne du foie et variations morphologiques des neurones cérébraux. H. Renauld-Capart (*Arch. intern. de physiol.*, 1921, **16,** 119-61).—Conclusion générale: Le métabolisme cérébral dans son entièreté, et par conséquent le travail psychique et la sensibilité consciente qui en découlent, sont sous la dépendance immédiate d'une sécrétion interne du foie, élaborant notamment un corps thermolabile, dont l'action semble être de favoriser la formation incessante de la substance chromatophile dans les neurones. En effet l'arrêt de la fonction hépatique provoque dans les neurones un état de chromatolyse de plus en plus marqué, marchant de pair avec la perte de l'activité cérébrale. Au contraire, le rétablissement de cette fonction provoque une réparation évidente de la substance chromatophile correspondant à la réapparition des fonctions des centres encéphaliques.—L. F.

2113. Über die Lokalisation der Wortblindheit. N. v. Mayendorf (*Fortschr. d. Med.* 1920, **37,** 739-48).—Description of a " word-picture " centre situated in the subcortical layers of the gyrus angularis.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2114. Beiträge zur Kenntnis des psycho-galvanischen Phänomens. F. Georgi (*Arch. f. Psychiat. u. Nervenkrankh.*, 1921, **62,** 571-97).—Observations on a boy with congenital lack of sweat glands in palm and sole which support the sweat-gland explanation of the reflex.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

SPECIAL SENSES

2115. Regeneration of the Lens in Diemyctylus. C. Ogawa (*J. Exp. Zool.*, 1921, **33,** No. 2).—The author describes in detail the regeneration. Some experiments were performed upon the upper iris. The lower iris is incapable of producing a lens, even when the regeneration from the upper iris is disturbed. By making a flap from the

upper iris, regeneration resulted in several different ways. The iris piece, transplanted in the retina, can start regeneration of the lentoid better than in the eye chamber.—W. D. H. (*W. I.*).

2116. Der Mechanismus der Pupillenbewegungen. C. Weskamp (*Rev. méd. d. Rosario*, 1920, **10,** 189-98).—A survey of the theories of the innervation of the iris. The final theory of the movements of the iris is that these are changes of tonus of the musculature brought about under the influence of the ciliary nerves, which receive impulses both from the oculomotor and the sympathetic nerves. The first controls the sensitivo-motor reactions in response to light, the latter the sensorio-motor to pain (visceral and motor sensations, etc.). The sympathetic also conveys inhibitory impulses from the cortex, and so determines the general dilatation during waking hours. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

2117. Sur le mécanisme central des mouvements des yeux. H. Gertz (*Acta med., Scand.*, 1920, **53,** 445-68).—The author distinguishes between the stationary condition, the sudden jerking, and the gliding movements of the eyes. Of these, the first two are regarded as elementary and as possessing each its central mechanisms. The gliding movement is supposed to be co-ordinated activity of the centres subserving the steady gaze and the rapid glance.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2118. Reflexbiologische studien an Bodenfischen. I. Beobachtungen an Amiurus nebulosus Les. O. Schiche (*Zool. Jahrb., Abt. f. Allg. Zool. u. Physiol.*, 1921, **38,** 49-112).—A study of the eye movements and sensory responses to light, touch, and surface contact in *Amiurus nebulosus*.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2119. Beobachtungen und Betrachtungen über die Beziehungen der Augen zum Nahrungserwerb bei Fischen. L. Scheuring (*Zool. Jahrb., Abt. f. Allg. Zool. u. Physiol.*, 1921, **38,** 113-36).—Fishes are divided into four main groups according as to whether they seek out their food by sight, smell, touch, or taste. In connection with the former group, the questions of the degree of correlation of the eye movements in the various types and their varying degrees of binocular vision are discussed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2120. Comparaison des temps de latence sensorielle en excitation lumineuse brève et prolongée. H. Piéron (*Compt. rend. soc. biol.*, 1921, **85,** 60-2).—Experiments on the relation between the latent period of visual stimuli and the duration of excitation. —J. H. B.

2121. The "All or None" Law in Visual Response. L. T. Troland (*J. Opt. Soc. Amer.*, 1920, **4,** 160-85).—When a brightly illuminated disc is fixated with a dark-adapted eye, two blue bands are observed which are due to stimulation of the retinal elements situated between macula and blind spot by the action currents of the directly stimulated elements of the macula itself. The subjective intensity of these two bands is found to be independent of the intensity or wave-length of the rays falling on the macula.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2122. Fechner's Law and Self-Luminosity of Eye. W. Peddie (*Proc. Roy. Soc. Edinburgh*, 1920-21, **41,** 60).—Fechner's law states that change of visual perceptivity is proportional to the fractional change in the intensity of the light. At weak intensities, a term regarded as constant has to be added to the intensity of the external stimulus on account of the self-luminosity of the eye. By integration over the whole stimulated part of the retina, Helmholtz obtained an expression for the perceptivity which agreed with observations in so far as the general nature of the relation between perceptivity and external stimulus is concerned. Close correspondence can be obtained by assuming that the self-luminosity term in Fechner's expression is itself a simple function of the external stimulus, rising rapidly to a maximum, and thereafter slowly falling to a steady value.—*Author's abstract.*

2123. Die Abhängigkeit der photoelectrischen Reaction des Froschauges von den ableitenden Medien. H. Beuchelt (*Zeit. Biol.*, 1921, **73,** 205-30).—In experiments of irrigation and diffusion of frog eyes, the author found that the variation of the retinal currents produced by illumination is negative under the influence of KCl, $BaCl_2$, $MgCl_2$, while it remains positive with LiCl and NaCl, as in a normal eye treated with "Ringer's solution." The "resting current" was negative in eyes treated previously with LiCl, NaCl, and "Ringer's solution," contrary to the positive current in fresh eyes and in eyes treated with KCl, $CaCl_2$, $BaCl_2$, $MgCl_2$. The different effect of the 2 groups of salts on the photoelectric reactions of the eye are correlated with those caused by the same salts on the skin currents after excitation of cutaneous nerves. —H. W.

2124. Über ein neues Phänomen der Farbenveränderung der menschlichen Augenhintergrundes im Zusammenhang mit der fortschreitenden Dunkeladaption. B. Nakamura (*Klin. Monatsbl. f. Augenheilk.*, 1920, **65,** 83-5).—A description of the colour changes in the retinal background during the delayed dark adaptation in patients with permanent hemeralopia. Injection of adrenaline much diminished the optic sensitivity consequent upon nine hours' dark adaptation, and led to changes of retinal colour.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2125. I. Die Lokalisation des Farbenkontrastes beim anomalen Trichromaten. II. Über Abweichungen im zeitlichen Ablauf der Nachbilder bei verschiedenen Typen des Farbensinns (Ein Beitrag zur Lokalisationsfrage). A. Guttman (*Zeit. f. Psych. u. Physiol. d. Sinnesorg.*, Abt. II., 1920, **51,** 159-64, 165-75).—I. By means of the experimental method which he describes the author shows that green light alone produces no colour sensation in anomalous trichromates, but that it does produce such a sensation when red light also falls on the retina. In these cases the increased colour contrast is situated in the retina. II. In the anomalous cases the after-images following stimulation by coloured light disappeared more rapidly than in the normal subject; this is associated with an abnormally rapid development of colour fatigue in these patients. In a deuteranope the formation of after-images was not less easy than normal.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2126. Nouvelles recherches sur le nystagmus et le sens du l'équilibre. V. G. Brabant (*Arch. méd. belges*, 1921, **74,** 257-324).—The author concludes that the extrinsic muscles of the eye are the peripheral sense organs for the sense of equilibrium, and that the labyrinth does not play as important a part as is generally attributed to it. The paper contains experimental work, and a full discussion.—E. P.

2127. Effects of Cutting the Lingual Nerve of the Dog. J. M. D. Olmsted (*J. Comp. Neurol.*, 1921, **33,** No. 2).—Taste buds disappear from the fungiform papillæ on the anterior part of the tongue as a result of cutting one lingual nerve; those on the other side remain in perfect order. This result is due to the cutting of the nerve, and not to other injuries from the operation. The process involved is one of degeneration accompanied by the phagocytic action of leucocytes. The site of former taste buds becomes occupied by epithelial cells.—W. D. H. (*W. I.*).

2128. Die Unterschiedsschwellen des Drucksinns bei möglichst verhinderter Reizausbreitung. K. Hansen (*Zeit. Biol.*, 1921, **73,** 169-90).—Experiments with different dimensions and different intensities of excitation partly under the impediment of the irradiation of the stimuli to the points of pressure in the neighbourhood (extensive changes of excitation) showed that Weber's law depends on extensive changes in relation to the pressure sense. The law does not hold for intensive excitation. Stimuli of different intensity are recognised if they are confined to one element of the pressure sense (one point of pressure). The "all or nothing" law has here no validity. —H. W.

2129. Contributo alto studio del substrato anatomico del senso muscolare. M. Rappini (*Riv. di biol.*, 1920, **2**, 348-86).—A detailed illustrated account of the various types of end organ associated with muscle sense, and of their anatomical relationships. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

CEREBRO-SPINAL FLUID

2130. Hydrocephalus. W. E. Dandy (*Bull. Johns Hopkins Hosp.*, 1921, **32**, 67-75). —This continues the work of Dandy and Blackfan (*J. Amer. Med. Assoc.*, 1913, **61**, 2216), and relates specially to "communicating hydrocephalus," in which the cerebral ventricles communicate freely with the subarachnoid space. In this form absorption from that space is reduced, and adhesions are found which obliterates the cisternæ. Any obstruction of the cisternæ produces hydrocephalus; observations on man after death are supported by experiments on dogs before and after death. When Indian ink is placed in the cisterna magna in a normal animal, the colour finds its way to the whole subarachnoid space; but when a perimesencephalic obstruction is introduced, the pigment stops abruptly at the barrier, and none reaches the hemispheres; hydrocephalus then develops, the holes in the roof of the 4th ventricle dilate, and a flow occurs into the ventricles of the brain. The cerebro-spinal fluid is stated to circulate in a mesothelial-lined vascular system; the cerebral ventricles are considered to be concerned only with the production of the fluid, and the subarachnoid spaces on the exterior of the brain with its absorption; hence, when the foramina are obstructed, the fluid accumulates in the ventricles; but in communicating hydrocephalus they are open, and the fluid reaches the cisterna magna, then passes under the brain-stalk to other cisternæ, whence it is distributed to the cerebral sulci, where it is absorbed. An obstruction in the cisternæ will cause hydrocephalus as effectually as a block in the Sylvian aqueduct. It is further stated that normally $\frac{3}{4}$ of the fluid is absorbed in the subarachnoid spaces of the brain, and the rest in the spinal region. By injecting air through a lumbar puncture, the existence of obstructions can be seen with X rays. —W. D. H.

2131. Die Beziehungen zwischen dem Liquor cerebrospinalis und der Hypophyse. O. Fleischmann (*Zeit. f. d. ges. Neurol. u. Psychiat.*, 1920, **62**, 171-93).—Injection of extract of posterior lobe of pituitary leads, after a preliminary fall, to a long-continued rise of arterial pressure, and so to increase of cerebro-spinal fluid. Hydrocephalus seems to be connected with damage of the pituitary.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2132. Iodine in the Cerebro-spinal Fluid. E. D. Osborne (*J. Amer. Med. Assoc.*, 1921, **76**, 1384-6).—Iodine is present in normal cerebro-spinal fluid, and its amount is increased after administration of iodides in any way, but especially intravenously, in which case the content bears a definite relation to the amount administered.—C. L. E.

2133. Présence d'alcohol dans le liquide céphalo-rachidien. Ducamp, Carrien, and de Claret (*Bull. de la soc. des sci. méd. Montpelier*, 1921, **2**, 161-2).—A note on the presence of alcohol in the cerebro-spinal fluid of chronic alcoholics.—E. P.

BLOOD

2134. Volume des globules du sang et rapport de ce volume à l'hémoglobine et du nombres des cellules. H. C. Gram (*Compt. rend. soc. biol.*, 1921, **84**, 151).—A mixture of 4·5 c.c. venous blood and 0·5 c.c. 5% sodium citrate is centrifuged for 90 minutes

at 3,000 revolutions per min. The per cent. volume is therefore 100 P/S, where P is volume of deposit in c.c. and S is volume of original blood. The results agree with those given by the hæmatocrit within 0·5 c.c. %. The ratio between volume and number of cells ("a volumetric index") is given by the formula vol. index = vol. % × 0·12/G, where G is number of cells per c.m. (This formula is probably wrong, and should read vol. index = $\frac{\text{vol. \%} \times 0{\cdot}12}{\text{G}} \times 10^6$.)—J. A. H. (*Med. Sci.*).

2135. Resistance of the Red Blood-Cells. C. H. Neilson and H. Wheelon (*J. Lab. and Clin. Med.*, 1921, **6**, 454-62).—A rapid method is described for the determination of the degree of resistance of the red blood-corpuscles to a specific hæmolytic agent, sapotoxin. The red blood-corpuscles normally show a remarkable degree of constancy in their resistance to a specific hæmolytic agent. Washing decreases this resisting power. It is therefore concluded that the presence of the blood-fluid about the red corpuscles acts in such a manner as to resist the hæmolytic action of sapotoxin.—D. H. de S.

2136. Über die Einwirkung von Röntgenstrahlen auf Amphibienlarven. Einwirkung geringer Strahlendosen auf das Blut und das blutbildende Gewebe von Rana temporaria Larven. A. Hartmann (*Arch. f. Entwicklungsmech.*, 1920, **47**, 131-209).—Exposure of tadpoles to Röntgen rays leads to a reduction of the leucocyte count. The lymphocytes were most affected, particularly the smaller ones. The polymorphs were less reduced, and the granular cells were hardly changed. These effects were correlated with histological changes in the blood-forming tissues.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2137. Einfluss der Temperatur auf die aktuelle Reaktion des Blutes. J. M. de Corral (*Biochem. Zeit.*, 1921, **117**, 1-9).—The reaction of the blood at 38° is P_H 0·22 lower than at 18° (as stated by Michaelis and Davidoff) if the blood is equilibrated with a CO_2 mixture at 38° and then cooled to 18° without further change. If the blood is equilibrated with the gas mixture and the E.M.F. measured at each temperature, then the reaction is the same, as Hasselbalch stated.—C. L. E.

2138. Reaction of the Blood in Secondary Anæmia. C. L. Evans (*Brit. J. Exp. Pathol.*, 1921, **2**, 105-14).—Although the immediate effect of hæmorrhage is a lowering of the alkali reserve of the blood, the response of the respiratory centre may partially compensate, or even over-compensate, for this change, so that the circulating blood may be either more acid, or less acid, or of the same reaction after as before the hæmorrhage. After 12 hrs. the reduction in alkali reserve is compensated, owing to increased excretion of acid by the kidney; subsequently the alkali reserve of the blood may become higher than the normal, and remain at this level until the corpuscular regeneration is complete. The response is a protective one against acidosis.—*Author's abstract.*

2139. Recherches chimiques et physiologiques sur les matières grasses et les lipoïds du sang. P. Lemeland (*Bull. de la soc. chim. biol.*, 1921, **3**, 134-69).—The technique for the estimation of various forms of fat and lipoid in the blood is given in detail; analytical tables are also given. The paper contains a very complete description of the analytical methods of other observers applicable to these substances, and a bibliography.—E. P.

2140. Coagulation of the Blood. I. The Rôle of Calcium. H. W. C. Vines (*J. Physiol.*, 1921, **55**, 86-99).—A rapid method of determining the Ca content of 0·5 to 1 c.c. blood or serum was devised. Part of the blood Ca is in combined form, the combination being broken down during clotting with the liberation of ionic Ca; Ca does not enter into the chemical composition of the clot. The combined fraction of Ca plays the important part in coagulation, the combination being formed with an organic radicle which has the power of adsorbing oxalate in excess of the equivalent amount

of Ca attached to it. Anticoagulants—oxalate, citrate, fluoride—inhibit clotting primarily by combining with the Ca-containing complex. To inhibit coagulation the anticoagulants must be added in amount greater than the chemical equivalent of the total Ca of the blood, so that the presence of Ca ions is not essential to the clotting process.—J. A. C.

2141. Une sécrétion d'origine nucléaire: L'antithrombine. Propriétés anticoagulantes des acides nucléiniques. M. Doyon (*Arch. intern. de physiol.*, 1921, **16**, 343-62).—L'incoagulabilité du sang des chiens auxquels ou a injecté de la propeptone dans les veines de la circulation générale, ou de l'atropine, de d'hyosciamine, de la morphine dans les veines du système porte, est due au passage dans le sang de *l'antithrombine* qui se forme dans le foie aux dépens des éléments nucléaires. L'antithrombine est une *nucléoprotéide*, riche en phosphore (3%), précipitant par les acides ou l'alcool, se dissolvant dans les solutions alcalines faibles, donnant faiblement la réaction du biuret. Séchée elle résiste à 105°. On peut l'extraire du plasma sanguin rendu incoagulable par les injections précitées: elle préexiste dans le foie d'où ou peut l'extraire soit directement de l'organe broyé, soit par une circulation artificielle au moyen d'une solution faiblement alcaline. Pour mettre en liberté l'antithrombine, il faut chauffer pendant quelques instants à l'ébullition, puis abandonner pendant 12 à 24 heures à la température du laboratoire. La congélation et décongélation successives favorisent l'extraction de l'antithrombine tant du foie que des liquides de lavage. Tous les organes, mais à un moindre degré que le foie, peuvent fournir des nucléoprotéides anticoagulantes. Les propriétés anticoagulantes appartiennent au noyau phosphoré ou résidu insoluble qui reste après action du suc gastrique artificiel sur la nucléoprotéide. Les acides nucléiniques préparés par le procédé de Neumann (*Arch. f. Physiol.*, Suppl. Bd., 1889, 552) possédent également le pouvoir anticoagulant *in vitro* et *in vivo*.—L. F.

2142. Globulins et temps de saignement—II. J. Roskam (*C. r. de la soc. belge de biol.*, 1921, 18-20).—Chez le chien, la diminution de coagulabilité sanguine par injection brusque de gélatine ou par injection d'extrait de tête de sangsues augmente la durée du temps de saignement. Cette augmentation est extrêmement intense après injection d'extrait de têtes de sangsues, probablement à cause d'une action empêchante exercée par cette extrait sur l'adhésion des globulins aux lèvres de la plaie; elle est très nette aussi après injection de gélatine lorsque l'hypoglobulinémie est intense. Le sang étant incoagulable, les globulins ne peuvent, à eux seuls, obturer, de façon efficace, une plaie vasculaire.—E. Z.

2143. Durch Reizbestrahlung der Leber beschleunigte Blutgerinnung. H. Tichy (*Zentralb. f. Chirurg.*, 1920, **47**, 1389-90).—Irradiation of the liver leads to even more marked diminution of the clotting time of the blood than does similar treatment of the spleen. This appears to be due to increased production of thrombokinase.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2144. Regeneration of Blood. E. M. K. Geiling and H. H. Green (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 191-2).—In rats on the usual mixed food, regeneration of blood was complete in from 7 to 10 days after a single hæmorrhage equivalent to 2% of the body-weight, and in 10 to 14 days after double hæmorrhage of 2% on 2 successive days. The amount of regeneration was determined from the erythrocyte count and hæmoglobin content. During starvation, regeneration followed single hæmorrhage in normal time, but after double hæmorrhage, the animals usually succumbed before regeneration was complete. Splenectomised rats appear to regenerate in normal time on normal diet. In rats on a diet deficient in protein, vitamin, or mineral matter, blood-regeneration after double hæmorrhage was appreciably delayed. On a fat-deficient diet regeneration after double hæmorrhage occurred in normal time.—D. H. de S.

2145. Über die Veranderungen im Blut nach Harnstoffgaben. Nonnenbruch (*Arch. exp. Path. Pharm.*, 1921, **89,** 200-18).—A reinvestigation of the amounts of urea in the blood and tissue fluids after large doses of urea by the mouth and intravenously. The author confirms the findings of Lichtwitz that a normal value for residual nitrogen (after a dose of urea) does not mean absence of N retention, and that a raised value does not mean that N retention has occurred. The course of the N curve depends on the amount of fluid given. Urea rapidly disappears from the blood-stream, and then is given back to it before excretion by the kidney. The distribution of urea in the tissues is not simply due to permeability and diffusion. The author considers that attempts to control the factors involved in the disappearance of urea from the blood by observations on the red cell count, amounts of serum NaCl and of serum protein, are futile. —J. H. B.

2146. Sur la recherche des albumoses dans le plasma sanguin, le sérum, les sérosités et les exudats. Ch. Achard and E. Feuillié (*Compt. rend. soc. biol.*, 1920, **83,** 1535-9).—In each fluid the free albumoses were determined after removal of coagulable proteins by 10% sodium chloride in acetic acid solution. In a similar manner the albumoses liberated by extraction with ether in acetic acid solution, or by treatment with lime-water in calcium acetate solution, were also estimated. The variations in these values were studied in normal and in pathological conditions. It is shown that the presence of bound albumose is one of the conditions necessary for the occurrence of the Wassermann reaction. Reference is also made to the influence of the fat-protein complexes in digestion, serum therapy, various conditions of shock, clotting, and in determination of arterial pressure.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2147. Isolierung von Aminosäuren aus Blut. E. Abderhalden (*Zeit. physiol. Chem.*, 1921, **114,** 250-4).—10 litres of ox-blood plasma, 5 l. of horse-blood plasma, 50 l. of horse serum, and 500 l. of ox serum were dialysed against water. The dialysate was evaporated to dryness at a low temperature, and the combined residues examined. All the known amino-acids were present, the weight of those isolated in pure condition being over 100 g.—H. W. D.

2148. Estimation of Calcium in Blood. M. Kahn and L. G. Hadjopoulos (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 200).—The calcium is precipitated from serum as calcium oxalate by the addition of ammonium oxalate. The precipitate of calcium oxalate is centrifuged off, washed, dried, and ashed to calcium oxide. The ash is dissolved in N/50 HCl, and the excess of HCl titrated with N/100 NaOH, using phenolphthalein as indicator. The amount of CaO can then be calculated. —D. H. de S.

2149. Calcium in the Blood. W. C. Thro and M. Ehn (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 189-91).—The results are similar to those already published by the authors (*cf.* Abstract No. 2719, Vol. V., p. 432), but a titration method of estimation was used instead of a gravimetric method, in order to avoid an error due to calcium in the filter-paper.—D. H. de S.

2150. Estimation of Sodium in Small Amounts of Serum. B. Kramer and F. F. Tisdall (*J. Biol. Chem.*, 1921, **46,** 467-73).—The sodium is precipitated from 2 c.c. of serum by alkaline potassium pyroantimonate with the aid of alcohol. After standing the precipitate is collected in a Gooch crucible, dried at 110° C., cooled, and weighed. Full description of the technique is given. Results are accurate to ±2·5% actual amount of sodium.—J. A. H.

2151. Procédé rapide et simple de dosage du calcium dans les liquides albumineux. P. Cristol (*Bull. de la soc. des sci. méd. Montpelier*, 1921, **2,** 159-61).—A simple method for estimating calcium in blood or other similar fluids. Small quantities of blood are required. The fluid is deproteinised by trichloracetic acid, and an aliquot part of the

filtrate is nearly neutralised by NaOH; after boiling it is diluted and ammonium oxalate added; the precipitate is collected, washed, and then H_2SO_4 added; filter, and the filtrate is titrated with standard permanganate.—E. P.

HEART

2152. Engelmann's Evidence for the Independence of Excitability and Contractility in Heart Muscle. T. Lewis and A. N. Drury (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** xii-xiii).—On excitation of the vagus while the auricle is being stimulated at a rate so rapid that it only responds to alternate shocks, the strength of the auricular beats is reduced, but the response is now to every shock. This is not, as Engelmann thought, because excitability and contractility alter in opposite directions, but because the vagus depresses all the properties, so that systole is shortened, with the result that the refractory period is reduced and each stimulus falls on excitable tissue (see Abstract No. 858, Vol. VI., p. 131).—C. L. E.

2153. Circus Movement in the Human Auricle. T. Lewis, A. N. Drury, and C. C. Iliescu (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** xviii-xix).—Evidence is given that flutter and fibrillation of the human auricle are due fundamentally to simple circus movement.—J. A. C.

2154. The Sinoventricular Bundle of the Rabbit's Heart. L. De Cady (*Anat. Rec.*, 1921, **21,** No. 4).—The sinus node and the atrioventricular node are identical in structure. Numerous nuclei in various stages of amitotic division can be seen, but the nuclei of the binucleated cells are closely adjacent to each other and there is no evidence of cytoplasmic division. The main portion of the atrioventricular bundle has a closely similar structure. In the Purkinje fibres, however, the nuclei are farther apart than in the portions of the conductive system higher up. In the transition areas between the Purkinje fibres and the ventricular myocardium only unpaired nuclei are found. No evidence appears either in the nodal tissue or in the bundle tissue indicating cytoplasmic division of the cells, nor is there evidence of a replacement of degenerated myocardial fibres by a genetic progression of cells from the sinus node to the ventricular myocardium.—W. D. H. (*W. I.*).

2155. The Replacement of Potassium by Uranium in Perfusion of the Heart. H. Zwaardemaker (*J. Physiol.*, 1921, **55,** 33-7).—Further experiments are described to show that uranium or any other radio-active element can be substituted for K in Ringer's fluid in perfusion without disturbing the automaticity of the heart of the frog and the eel, provided the amount of the element substituted is radio-equivalent to that of the K in the fluid. The amount of uranium required for effective substitution is not the same in summer as in winter frogs. The question why a temporary standstill may sometimes happen at the moment of transition from one fluid to another is discussed. Radio-activity, and not a disturbance of ionic balance, is the strict condition for automaticity.—J. A. C.

2156. Effects on the Frog's Heart of Varying the Alkalinity and Calcium Content of the Perfusing Fluid. W. Burridge (*J. Physiol.*, 1921, **55,** 111-3).—The effect of alkali depends within certain limits on the amount of Ca in the perfusing fluid, and similarly the effect of Ca depends on the amount of alkali. Perfusion of the heart with a solution deficient in Ca allows the alkalinity to be increased beyond the limit (P_H=12), which otherwise stops the heart in systole, the heart beating strongly after a primary slight depression. Increase of Ca prevents both the primary depression and the subsequent augmentation.—J. A. C.

2157. Die Wirkung des Kampfers auf das Wühlen des Froschventrikels. A. Frohlich

and M. Grossmann (*Arch. exp. Path. Pharm.*, 1921, **89**, 1-16).—The authors previously showed that powerful prolonged faradisation of the A-V bundle produced ventricular peristalsis in the frog's ventricle, which continued after stimulation ceased. Under the influence of camphor, the movement stopped when stimulation ceased. De Boer has shown that a similar ventricular peristalsis is produced by a single stimulus, provided this falls immediately after the refractory period is over, at a moment when the metabolic condition of the ventricle is still poor. The authors confirm the work of de Boer, and conclude that the effect of camphor is to improve the metabolic condition of the heart.—J. H. B.

2158. Entgiftung durch adsorptive Verdrängung. Ein Beitrag zur Kenntnis der Ermüdung des überlebenden Froschherzens und der Herzwirkung des Kampfers. H. Wieland (*Arch. exp. Path. Pharm.*, 1921, **89**, 46-65).—The frog heart, when rendered hypodynamic by prolonged perfusion with Ringer's solution, may be restored by substances which also restore a frog heart which has been treated with sodium desoxycholate. Such substances are serum, sodium oleate, ether, xylol, camphor, and charcoal. All these act by becoming adsorbed on the surface of the heart, and then abstract the desoxycholate. Camphor has not a specific cardiac action.—J. H. B.

2159. La signification des changements du rythme cardiaque produits par la perfusion avec la nicotine. D. T. Barry (*Arch. internat. pharm. et thér.*, 1921, **25**, 391-401).—Experiments dealing with the action of nicotine in reversing the usual direction of conduction of impulses in the frog heart. The precise observations made are not clearly stated.—J. H. B.

2160. Le diagnostic pathogénique des bradycardies et les épreuves de l'atropine et du nitrite d'amyle. H. Fredericq et A. Descamps (*Arch. intern. de physiol.*, 1921, **16**, 162-71).—(1) La compression graduée de la région auriculo-ventriculaire du chien permet de réaliser une bradycardie ventriculaire avec conservation de l'action arrestatrice des vagues sur les ventricules. L'animal porteur d'une bradycardie de ce genre réagit encore par une accélération du rythme ventriculaire à la double vagotomie, à l'injection intraveineuse d'atropine ou à l'inhalation de nitrite d'amyle. En clinique, une réponse positive des épreuves de l'atropine ou du nitrite d'amyle ne doit donc pas faire conclure nécessairement à une hypertonicité du pneumogastrique et n'exclut pas la possibilité de l'origine intracardiaque ou myocardique de la bradycardie en cause. Ces constatations restreignent singulièrement le nombre de cas où les dites épreuves peuvent se légitimer. (2) L'action tonique du vague continue, si les voies nerveuses sont intactes, à s'exercer sur le rythme idio-ventriculaire.—L. F.

2161. De l'action du chlorure de baryum sur le cœur de tortue in situ et sur son mode d'arrêt. M. Le F. de Arric (*Arch. internat. de pharm. et de thér.*, 1920, **25**, 283-93).—Barium chloride always produces increase of tone of the heart. Strong concentrations lead to systolic standstill. With solutions of medium strength the heart recovers on washing out the barium. Dilute solutions lead to increase of amplitude of heart, together with occasional pauses in the systolic condition.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2162. Action du bleu de méthylene sur l'appareil cardio-inhibiteur de la grenouille. C. Heymans and E. Maigre (*Compt. rend. soc. biol.*, 1921, **85**, 45-8).—Injection of 0·4 c.c. of a 1% solution of methylene blue into a frog knocks out the cardiac inhibition previously produced by vagus stimulation of a given strength. It is not known whether the action is on muscle or nerve.—J. H. B.

2163. Über Trennung der intracardialen Vagusfunction von der motorischen Leistung des Froschherzens. III. Versuche über Totenstarre des Herzens. L. Haberlandt (*Zeit. Biol.*, 1921, **73**, 151-67).—A temporary or permanent functional dissociation of the vagus endings could be determined in frog hearts which were restored

to life by perfusion with blood from the state of total paralysis or rigor after 20 to 24 hours.—H. W.

2164. Über die Wirkung des Kalzium-Entzuges am überlebenden Froschherzen. K. Hansen (*Zeit. Biol.*, 1921, **73,** 191-204).—The injury of the heart by Ca deprivation shows a different progress for the ventricle and the auricle. The capability of contraction of the ventricle is diminished until a certain minimum is reached. The undisturbed progress of the excitation of the heart becomes manifest in the electrocardiogram. Then the conduction of excitation from the auricle to the ventricle is impeded. The ventricle beats no longer spontaneously. Direct excitability towards faradic and galvanic stimulation is preserved. The participation of the ventricle is regained by increase of pressure. The direct excitability of the ventricle lasts until the heart dies. The action of the auricles outlasts the action of the ventricle 10 to 15 hours. The auricles are not restored by Ringer's solution.—H. W.

2165. Regularity of Simple Paroxysmal Tachycardia. H. S. Feil and M. D. D. Gilder. **Pulse in Aortic Disease.** Same authors. **Arborisation Block.** A. N. Drury. **Heart Block influenced by the Vagus. Flutter and Fibrillation.** T. Lewis and T. F. Cotton. **Paroxysmal Tachycardia.** G. C. Robinson and G. R. Herrmann. **Flutter and Fibrillation.** 4 papers by T. Lewis and others. **Incomplete Bundle Branch Block.** F. N. Wilson and G. R. Herrmann (*Heart*, 1921, **8,** 1, 4, 23, 31, 37, 59, 83, 141, 171, 193, 229-95).—Mostly long papers dealing in full with the matters indicated, some of which, especially the work of Lewis, have already been noticed in these pages. The above is a complete list of the papers in the first 2 numbers of *Heart*, vol. **8.** Though largely of clinical interest, all will doubtless be read by specialists in this technical branch of study.—W. D. H.

CIRCULATION

2166. Spontaneous Movements of Bloodvessels. R. J. S. McDowall (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** i).—During perfusion of the pulmonary circulation with Ringer-Locke fluid (without bicarbonate) waves of contraction and relaxation have been found to occur frequently in young and robust rabbits and cats, graphic records being obtained. The waves are not always regular, varying from 1 or 2 to 10 per min., continuing, it may be, for several hours. Pituitary extract, adrenaline, and temporary distension of the lung alveoli have a stimulating effect.—J. A. C.

2167. Ein neues Verfahren zur Prufung der Gefässfunktion. P. Morawitz and G. Denecke (*Münch. med. Woch.*, 1921, **68,** 659-61).—The authors have attempted to investigate the factors causing œdema by estimating the percentage of protein in serum (1) from blood drawn from a vein; (2) from blood withdrawn after 12 minutes' compression of the brachial artery. They find an average difference amounting to 5 or 6%. They conclude that there is evidence of a permeability of the vessels.—J. H. B.

2168. Capillary Pressure and Œdema. L. Hill (*Brit. Med. J.*, 1921, i., 767-71).—In this lecture the methods used for measuring capillary pressure are described, and the results obtained by the lecturer and his co-workers are given and discussed. Most of this work has already been published by them (see Abstracts Nos. 295, 867, 876 1298, Vol. VI., pp. 45, 133, 134, and 193, respectively).—D. H. de S.

2169. Kapillarvergiftung durch Gold und Platin. H. Gelpke (*Arch. exp. Path. Pharm.*, 1921, **89,** 280-99).—Gold and platinum are for the living animal poisons which act by paralysing the contractile mechanism of the capillaries.—J. H. B.

2170. Über die Bedeutung der Bestandteile der Ringerschen Lösung für die Gefässer-

regbarkeit überlebender Organe. A. K. E. Schmidt (*Arch. exp. Path. Pharm.*, 1921, **89,** 144-70).—The author has made a thorough investigation of the effect of changes in the quantity of the various ions in Ringer's solution on the response of the vascular system of the hind-limbs of a frog to adrenaline. A rise in the concentration of Ca-ions diminishes the constriction produced by adrenaline, and also that resulting from sympathetic stimulation, but does not affect the constriction produced by barium salts. In certain cases, after a rise in the Ca-ions, the pressor effect of adrenaline was even reversed. A rise in K-ions also reduced the pressor effect of adrenaline, but a rise in Na increased it. The great difference in the response to adrenaline when the perfusion fluid is changed from Ringer's solution to physiological saline is, however, due to the absence of OH′. This point is proved with much care. The author considers that the most important influence of all on vaso-motor excitability is the hydroxyl-ion concentration.—J. H. B.

2171. The Pulmonary Circulation. F. A. Bainbridge and S. W. F. Underhill (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** xi-xii).—With the chest open and with artificial respiration, ligature of the left pulmonary artery causes an immediate rise of pressure in the main pulmonary artery. With the chest closed and with natural respiration after ligature of the left pulmonary artery, the animal showed considerable dyspnœa, followed in 3 out of 4 cases by death. Post-mortem, the lung is obviously blanched after the experiment with the chest open, whereas with the chest closed the lung appears as full of blood as the sound lung, blood being sucked into it, owing to negative pressure, from the left auricle.—J. A. C.

RESPIRATION

2172. Alpinism. J. Barcroft (*Lancet*, 1921, i., 1277-9).—Condensed report of a lecture in which the main data, which the author himself has done so much to supply, are given in a lucid way.—W. D. H.

2173. Emploi de l'oxygène, additionné de gaz carbonique, en injections sous-cutanées, comme traitement du mal des altitudes et de certaines dyspnées toxiques. R. Bayeux (*Compt. rend.*, 1921, **172,** 1388-90).—There are two varieties of mountain sickness, the dyspnœic and the toxic. The symptoms of the latter are sickness, violent headache, shivering, fall of temperature, and slow, thready pulse; it may end fatally. Inhalations of oxygen are of little use in this type, but subcutaneous injections of oxygen give relief (see Abstracts No. 240, Vol. V., p. 38, and No. 315, Vol. VI., p. 49). The absorption of the oxygen is facilitated by the subsequent injection of CO_2 into the subcutaneous pocket containing the gas, the CO_2 constituting about 25% of the mixture. Personal experiences are given. It has also been found that such injections are of use in toxic dyspnœa.—J. A. M.

2174. Respirationversuche an neugeborenen Tieren. R. Plaut (*Zeit. Biol.*, 1921, **73,** 141-50).—Experiments on the respiratory changes of new-born animals (dogs, cats, guinea-pigs, rabbits, and mice) during the 10 first days of life. The results are given in tables.—H. W.

2175. Sur la vagotomie bilatérale chez le cobaye. L. Giusti and B. A. Houssay (*Compt. rend. soc. biol.*, 1921, **85,** 29-30).—See Abstract No. 1627, Vol. V., p. 262.—J. H. B.

2176. On the Relation of K in Hill's Equation to the Carbonic Acid Pressure in the Blood. G. S. Adair (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** xvi-xvii).—Examination of curves shows that $1/K = au + b$, where u is the CO_2 pressure and a and b are constants. In normal persons $a = 92-68$, and $b = 400-700$, in dyspnœic cases $a = 75-187$, and $b = 320-1{,}000$—*i.e.*, K is smaller in dyspnœa.—C. L. E.

2177. Respiration and Circulation in the Cat. I. The Influence of an Acute Anoxic Anoxæmia on Respiration and Circulation. Y. Doi (*J. Physiol.*, 1921, **55,** 43-9).—When the cat is subjected to an oxygen pressure lower than that of the ordinary atmospheric air, the minute volume of blood is the same as that when the breathed air is normal, regarding the hæmoglobin concentration as the same. After a short exposure to a low oxygen pressure, the cat takes up the same amount of oxygen as that in the normal air. In an acute anoxic anoxæmia the volume of the respiration per minute increases, the frequency of respiration and pulse increases, and the output of each heart-beat decreases. The decrease of the percentage saturation of oxyhæmoglobin in the arterial and venous blood is nearly parallel, so that the difference of oxygen content of the arterial and venous blood is fairly constant.—J. A. C.

2178. Observations on "Second Wind." N. W. MacKeith, M. S. Pembrey, W. R. Spurrell, E. C. Warner, and H. J. W. J. Westlake (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** vi-vii).—Experiments upon "second wind" showed that the condition is accompanied by a fall in the percentage of CO_2 in the alveolar air as compared with the samples taken during dyspnœa. Further experiments are made to determine the factors concerned in the compensation, the urine and the sweat being examined. Very little urine could be obtained during the latter part of dyspnœa and during "second wind." During dyspnœa the acidity of the urine fell as in normal diuresis, whereas during "second wind" it rose rapidly. Similarly, ammonia fell during dyspnœa, and rose rapidly during "second wind." The onset of sweating closely corresponded with the establishment of "second wind," the sweat giving definite amounts of lactic acid. —J. A. C.

2179. Zur Kenntnis des oxydativen Zuckerabbaus im Tierkörper. J. Hirsch (*Biochem. Zeit.*, 1921, **117,** 113-6).—By using dimethylhydroresorcine to fix any acetaldehyde produced in respiring frog muscle, it is shown that appreciable amounts of this substance may be formed, presumably from carbohydrate.—C. L. E.

2180. The Oxygen Use of Muscle and the Effect of Sympathetic Nerves on it. H. Nakamura (*J. Physiol.*, 1921, **55,** 100-9).—The sympathetic system does not increase the O_2 use of muscles of the cat's leg, since the O_2 usage was found to vary little with great variation in rate of blood-flow, and section of the sciatic nerve did not cause decrease of O_2 use, whilst stimulation of the sympathetic nerves caused a decrease of O_2 use.—J. A. C.

2181. Cholestérine du sang du cœur droit et du cœur gauche. Action cholestérolytique du poumon. J. E. Abelous and L. C. Soula (*Compt. rend. soc. biol.*, 1921, **85,** 6-7).—The blood of the right heart contains more cholesterol than that of the left heart. This is explained by the lungs taking up a large amount of cholesterol during 24 hours. The lungs are powerful destructors of cholesterol.—J. H. B.

ALIMENTARY CANAL

2182. Effets de la section et de l'excitation des nerfs propres de l'estomac sur la motricité de cet organe. Latarjet, Cluzet, and Wertheimer (*Compt. rend. soc. biol.*, 1921, **84,** 985-7).—By cutting certain terminal branches of the vagus in dogs, the authors have obtained a dilatation of a corresponding part of the stomach. An application of this to human surgery is suggested.—J. H. B.

2183. Die Cellulosegärung im Pansen des Ochsen und ihre Bedeutung für Stoffwechselversuche. W. Klein (*Biochem. Zeit.*, 1921, **117,** 67-8).—Criticism of the ratio of 2·6 given by Krogh and Schmit-Jensen (Abstract No. 437, Vol. VI., p. 66), chiefly on the ground of priority.—C. L. E.

2184. Azione della saliva sull' amido in presenza di succo gastrico e di succo pancreatico. S. Pastore (*Arch. di farm. sperim. e sci. aff.*, 1920, **30,** 173-6 and 177-84).—Ptyalin will act on starch even in acid solution if gastric juice or contents or pancreatic juice or extract be present. An excess of starch will protect the enzyme from the action of the gastric hydrochloric acid, so that its activity may be manifested even in the small intestine.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2185. Recherches comparatives sur le functionnement du foie à la suite de l'anésthésie chirurgicale par le chloroforme, l'éther, le protoxyde d'azote ou la novocaïne. F. Widal, P. Abrami, and J. Hutinel (*Compt. rend.*, 1921, **172,** 1145-9).—Widal, Abrami, and Ivanesco have previously shown that an early indication of hepatic insufficiency is the loss of the proteopexic function of the liver, indicated by hæmoclasia following a protein meal (see Abstract No. 3530, Vol. V., p. 559). In the present paper the authors show that there is a loss of the proteopexic function of the liver, accompanied in many cases by retention of bile-salts and urobilinuria, after the administration of a general anæsthetic. Chloroform produces this result even when the administration is of short duration; ether and nitrous oxide only if the administration is prolonged. The effect appears in 26 to 48 hrs., and lasts a few days. Subcutaneous or intraspinal administration of novocaine has no such effect. It is concluded that general anæsthesia is not contra-indicated when the liver is normal, but is attended with risk when a lesion of the liver exists.—J. A. M.

2186. Über den Gehalt des Chymus verschiedener Darmabschnitte an einzelnen Aminosäuren und Polypeptide. E. Abderhalden (*Zeit. physiol. Chem.*, 1921, **114,** 290-300).—The intestines of freshly slaughtered cattle were tied off at intervals of 3 metres and the contents examined. Most of the ordinary amino-acids were identified, and simple peptides were shown to be present.—H. W. D.

2187. Electrical Variation of the Pancreas. G. V. Anrep and I. de Burgh Daly (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** ii-iii).—Electrical variations of the pancreas observed after the injection of secretin are due to the increased activity of the gland, and are not due to artificial production of an E.M.F. Non-polarisable electrodes used in these experiments were made of kaolin and 0·9% NaCl, and did not show the production of an E.M.F. during the movement past them of a salt solution, as is the case with silver chloride electrodes. Again, after occlusion of the pancreatic cannula distal to the electrode and injection of secretin, there was an electrical variation, although there was no movement of juice past the electrode.—J. A. C.

2188. Hitzesekretine. A. Bickel and C. v. Eweyk (*Sitzungsber. d. preuss. Akad. d. Wiss.*, 1921, **17,** 325-7).—After hydrolysing protein (casein, egg-yolk) with HCl at 100° C., the product causes a flow of juice from the small stomach of a Pavloff dog when given subcutaneously. If such material is ineffective, it gains the character of gastrin by heating for 3 to 4 hrs. at 130° to 180°. The chemical nature of this heat secretin is uncertain, as is also whether it consists of one or more substances. Secretins are classified into (*a*) those normally formed in body—*e.g.*, the gastrin of Edkins, and secretin of Bayliss and Starling; (*b*) those preformed in the food—*e.g.*, the secretins of whey and spinach; (*c*) those obtainable from food material by treatment—*e.g.*, heat secretin.—W. D. H.

2189. The Effect of Age on Pancreatic Enzymes. F. Fenger and M. Hull (*J. Biol. Chem.*, 1921, **46,** 431-5).—Powdered pancreas preparations kept for one year under ordinary conditions diminish very materially in amyloclastic and in lipoclastic activity. Certain samples become completely inert. The proteoclastic activity remains constant.—J. A. H.

2190. Sur l'activité secrétrice de l'intestin chez l'embryon humain. Contribution à l'histophysiologie des organes digestifs de l'embryon. M. Parat (*Compt. rend. soc. biol.*,

1921, **84,** 71-3).—The epithelial cells of the ileum of human embryos of varying ages were filled with eosinophile granules; these also occurred in the meconium. Apparently secretion occurs in the embryonic gut between the third and the eighth months.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2191. Sur l'apparition de la présure pendant la vie fœtale. C. Porcher, J. Voron, and A. Tapernoux (*Compt. rend. soc. biol.*, 1920, **83,** 1439-40).—A study of the milk-clotting activity of stomach extracts derived from fœtuses (calf and human) of various ages. The rennetic activity increases with the age of the fœtus.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2192. The Fat Content of Fæces of Young Calves. P. E. Howe (*Amer. J. Dis. Children*, 1921, **21,** 57-64).—On the third day after birth the fat content of the fæces is almost double that found on the previous or following days. The adaptation of the alimentary canal to a normal milk diet takes three days.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

DIET

2193. Nutrition in Working-Class Families in Glasgow, April, 1921. Annabel M. T. Tully (*Lancet*, 1921, ii., 57-9).—Eleven representative families were chosen, and dealt with statistically. The results are disconcerting. In this time of unemployment the rations are at a low level, and in some cases even worse than in Vienna.—W. D. H.

2194. Growth on Diets containing more than Ninety per Cent. of Protein. T. B. Osborne and L. B. Mendel (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 167-8).—At an early stage of the experiments rats grew to 3 times their weight on diets containing more than 90% of casein, and in which the vitamin-bearing substances were the only noteworthy sources of either fat or carbohydrate, and supplied 4 to 8% of the food eaten. Whether the rats will attain adult size and normal function on such diets remains to be determined.—D. H. de S.

2195. Estimation of Carbohydrates in Vegetable Foods. V. C. Meyers and H. M. Croll (*J. Biol. Chem.*, 1921, **46,** 537-51).—Free soluble sugars are extracted with water, and are determined by reduction of sodium picrate to sodium picramate, both before and after hydrolysis of non-reducing sugar with picric acid. For estimation of total available carbohydrate, " taka-diastase " followed by mild acid hydrolysis is employed, the reducing sugar formed being estimated by sodium picrate in the usual manner. Numerous tables of sugar contents are given for various vegetables. A large proportion of the available carbohydrate occurs in a soluble form. The effect of different factors in cooking is discussed.—J. A. H.

2196. Animal Utilisation of Xylose. E. W. Rockwood and K. G. Khorozian (*J. Biol. Chem.*, 1921, **46,** 553-8).—Feeding experiments on rabbits, cats, dogs, and man. The limit of xylose utilised by animals is low. The amount of pentose used is inversely proportional to the amount of other carbohydrate (*e.g.*, starch) in the food. The utilisation of xylose is greatest in the rabbit, least in cat and dog, intermediate in man. (Usually the pentose was not isolated, but administered as a syrup.)—J. A. H.

2197. Evil Effects of Excess of Protein on Milk Secretion. Gladys A. Hartwell (*Lancet*, 1921 i., 1240).—The data in rats may be applicable to human mothers, hence the authoress publishes her main findings (Abstract No. 1922, Vol. VI., p. 277) in a clinical journal.—W. D. H.

2198. Chlorine Content of Milk and Blood after Ingestion of Sodium Chloride. W. Denis and W. R. Sisson (*J. Biol. Chem.*, 1921, **46,** 483-92).—Chlorine starvation and feeding with moderate amounts of chlorides do not cause any change in the amount

of chlorides in the milk. If, however, large doses of chloride are given, sufficient to increase the chloride in the blood-plasma, the chloride content of milk is increased.—H. E. R.

VITAMINS

2199. Über den Einfluss von akzessorischen Nährstoffen auf die Zellatmung. P. György (*Jahrb. f. Kinderheilk.*, 1921, **94,** 55-63).—Accessory substances from milk and vegetables have the property of increasing cell respiration in isolated cells. (Compare Abstract No. 380, Vol. VI., p. 58.)—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2200. The Relation of Plant Carotinoids to Growth and Reproduction of Albino Rats. L. S. Palmer and C. Kennedy (*J. Biol. Chem.*, 1921, **46,** 559-78).—The alleged relation of carotinoids to fat-soluble vitamin is discussed. There are no carotinoid pigments in the albino rat. Rats may grow and reproduce with *carotinoid-free* egg-yolk as the sole source of fat-soluble vitamin. It is concluded that these pigments and fat-soluble vitamin are not identical, and are not even quantitatively associated in plant tissues in which both, presumably, are synthesised.—J. A. H.

2201. Food Deficiency as an Influence on the Calcification and Fixation of the Teeth. F. M. Wells (*Brit. J. Dental Sci.*, 1921, **64,** 135-50).—The importance of the food factor is urged from the writings of others, and the author's experience, combined with experiments on guinea-pigs; he finds scurvy does affect the tooth pulp.—W. D. H.

2202. The Addition of Yeast to a Milk Diet. P. B. Hawk, C. A. Smith, and O. Bergeim (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 168).—Rats fed on pasteurised milk and yeast grew more than rats fed on pasteurised milk only.—D. H. de S.

2203. Rickets in Rats. H. C. Sherman and A. M. Pappenheimer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 193-7).—Rats put, at the age of 28 to 30 days, upon a diet consisting of patent flour and NaCl, usually lived about 6 weeks, with hardly any change either in body-weight or total body calcium. Such rats showed multiple fractures, deformity of the thorax, and osteoporosis. In parallel experiments in which calcium lactate, with or without ferric citrate, was added to the diet of patent flour and NaCl there was little or no growth, but the body gained sufficient calcium. These rats uniformly showed rickets. When, with all other conditions the same, 0·4% of potassium phosphate was introduced into the diet, rickets was prevented; growth was, however, suspended, but there was increased assimilation of calcium. The authors do not claim that the cause of rickets is a deficiency either of potassium or phosphorus, but they consider that they have demonstrated that rickets may be caused or prevented without change in the proteins or vitamins of the diet, neither of which can therefore be a predominating factor.—D. H. de S.

2204. Experimental Rickets. P. G. Shipley, E. A. Park, E. V. McCollum, and Nina Simmonds (*Johns Hopkins Hosp. Bull.*, 1921, **32,** 160-6).—Rats were fed on diets containing varying amounts of vitamin A and phosphates. Deficiency in both led to bone changes like those seen in rickets; the differences between them and those in human rickets are illustrated by plates. If the phosphate ion was increased in the diet, no rachitic change took place, although the vitamin still remained low. Deficiency in fat-soluble A cannot therefore be the sole determining factor in rickets. Its deficiency, however, causes xerophthalmia. The level of the blood-phosphate may be determined in part by the amount of available vitamin A; the latter, therefore, may be, after all, an etiological factor in rickets.—W. D. H.

2205. Vitamins in Sun-Dried Vegetables. J. A. Shorten (*Proc. Roy. Soc. Med.*, 1921, **14,** Sect. of Ther., 20-1).—The climatic conditions in Baluchistan are such that complete desiccation is possible in a day. An important branch of Indian industry is thus

springing up. The vegetables (carrots, brinjal, spinach, cabbage, tomatoes, turnips, etc.), after cooking, retain their original flavour and colour. Tomatoes, cabbage, and potatoes retain (especially the first named) much of their antiscorbutic properties (tested on guinea-pigs); the rest do not. No loss of the antineuritic vitamin was noted in any case (experiments on birds). Sun-dried vegetables should be used as much as possible as salads, for cooking destroys much of their antiscorbutic vitamin.—W. D. H.

2206. Antiscorbutic and Antiberiberi Properties of Sun-Dried Vegetables. J. A. Shorten and C. B. Ray (*Biochem. J.*, 1921, **15**, 274-85).—Sun-dried tomatoes, potatoes, and cabbage are antiscorbutic; carrots, brinjal, spinach, turnips, and turnip-tops only slightly or not at all. Cooking diminishes the antiscorbutic content, and factory-dried vegetables entirely lack this vitamin. Carrots, brinjal, spinach, cabbage, tomatoes, and potatoes, after sun-drying, possess antineuritic properties.—J. A. H.

METABOLISM

2207. The Regulation of the Water Content of the Human Organism. E. F. Adolph (*J. Physiol.*, 1921, **55**, 114-32).—An attempt to define some conditions determining the amount of water in the body is made by introducing water and other substances—urea, salts—via the alimentary tract. Water in excess of other anabolic material is not retained; 1% sodium chloride is retained longer than the other solutions studied. Water may be abstracted from the body by lowering the normal intake and by perspiration. The body-weight is completely restored by drinking water, if no other body constituent has been abstracted. A moderate deficiency of water does not constitute a limiting factor for growth in weight. An accurate indication, whether the water of the body is present in normal quantity, is obtained from the study of the excretion of water, chloride, and urea during a diuresis due to any one of these. The water content of the whole organism is independent of every other single substance. The content may be raised by introducing a temporary store of salt or carbohydrate; this water is not a part of the essential structure of the body. Other than this, no evidence has been found for a reserve of "free" water, and in thirst the excretion of water is kept up at the expense of water from the tissues themselves. Water held by the organism is distinct from water freshly absorbed from the alimentary tract. The evidence for this structural nature of body water is discussed. The supply of circulating water is kept constant, even at the expense of tissue structure, just as amino-acids and glucose are kept constant during starvation.—J. A. C.

2208. Über das Verhalten des Blutes und Korpergewichtes nach Schweissverlusten und Theocingaben bei halogenreicher und halogenarmer Ernahrung. L. Bogendörfer (*Arch. exp. Path. Pharm.*, 1921, **89**, 252-61).—Experiments on the loss of weight produced by severe sweating. This loss is not replaced by drinking large amounts of water unless an adequate supply of chloride (or NaBr) is provided as well. After doses of theocin there is a similar loss of weight, very pronounced when given to patients on a salt-free diet. After a sweat-bath there is a rise in the number of red cells maintained so long as chloride is deficient, a changing content of serum protein, and a fall in NaCl in the serum.—J. H. B.

2209. Rate of Growth of the Dairy Cow. Extra-uterine Growth. S. Brody and A. C. Ragsdale (*J. Gen. Physiol.*, 1921, **3**, 623-33).—In addition to the intra-uterine cycle, there are two extra-uterine ones, with maxima at 5 and 20 months. The equation to a unimolecular autocatalytic reaction applies to the cycle with maximum at 5 months. When applied to that with maximum at 20 months, the calculated values are too high, probably due to retarding effect of pregnancy and lactation on growth.—W. M. B.

2210. Effects of Thirst—II. T. Kudo (*J. Exp. Zool.*, 1921, **33,** No. 2).—Albino rats about a month old were kept at constant weight for several weeks by a restricted amount of liquid (milk) in a diet otherwise adequate for growth. The rats show a progressive tolerance of thirst, so that less liquid milk daily is required for maintenance as the experiment proceeds. The growth tendencies of the various organs in the young rats, during the thirst experiments, correspond in general to those found in rats of similar age during underfeeding, although certain exceptions occur (testes and kidneys). Likewise the results of the thirst tests (also those of the inanition experiments) show a general resemblance to results of similar tests in adults. There are, however, certain differences according to age as well as according to the type of inanition employed. Some organs gain, some lose weight, others remain unaffected. Full details are given for each.—W. D. H. (*W. I.*).

2211. Organic Regulation. I. The Composition of the Urine and the Blood of the Hibernating Frog, Rana virescens. H. C. van der Heyde (*J. Biol. Chem.*, 1921, **46,** 421-30).—Preparatory to a study of the involution of the tail of the tadpole, the amount of urea, ammonia, and uric acid have been estimated in the urine and blood of frogs.—H. E. R.

2212. Amino-acids in Nutrition. III. Is Proline a Growth-limiting Factor in the Proteins of Peas? What Nucleus in Zein is Responsible for Supplanting these Proteins? B. Sure (*J. Biol. Chem.*, 1921, **46,** 443-52).—The answer to the first part is in the negative. Zein possibly contains some hitherto unisolated amino-acids which contain the required nucleus.—J. A. H.

2213. Choline as a Precursor of Creatine. W. F. Shanks (Proc. Physiol. Soc. *J. Physiol.*, 1921, **55,** viii-ix).—Intravenous administration of choline tends to raise the creatine content of muscle, independent of any change in the water content. The quantitative results are not incompatible with Riesser's theory of the conversion of choline into creatine by linking with urea.—J. A. C.

TEMPERATURE

2214. Observations on the Body Temperature of Dry Cows. M. Kriss (*Proc. Nat. Acad. Sciences, U.S.A.*, 1920, **6,** 539-41).—The rectal temperature was found to be about 3° F. higher than the vaginal temperature, but showed parallel variations. The daily variations were followed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2215. Über den Einfluss bewegter Luft auf das thermische Verhalten des Menschen. B. Lange (*Zeit. f. Hyg. u. Inf.*, 1921, **91,** 473-97).—An account of experiments on the effects of air currents of various velocities on the skin temperature of the human subject.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2216. The Rôle of the Nervous System in the Regulation against Cold. H. G. Barbour and E. Tolstoi (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 184-6).—Dogs with section of the spinal cord between the 6th and 7th cervical segments are unable to withstand baths of 20° C., showing a rapid fall in body temperature usually to a dangerous level within 40 minutes. They do not shiver. Their blood shows a low percentage of solids. It is concluded that the rôle of the nervous system in the reaction against cold is to convey impulses from the temperature sense nerve endings to the "heat centres," which, in turn, besides shivering and vaso-constriction, incite blood thickening. The increased concentration of the blood lessens the water available either for heat dissipation by evaporation, or for providing enough blood to flood the peripheral vessels.—D. H. de S.

2217. Environmental Temperature Changes and Blood Concentration. H. G. Barbour

(*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 186-8).—Normal dogs respond regularly to a moderately high environmental temperature by blood dilution, and to a cold environment by blood concentration. The change is usually about 2% of the total blood weight, which means a 10% change in the fluid content of the blood.—D. H. de S.

2218. Über Fieberreaktionen bei Geisteskranken nach intravenösen Injektionen mit Ringerscher Lösung. W. Jacobi (*Zeit. f. d. ges. Neurol. u. Psychiat.*, 1920, **61,** 219-28).—The temporary rise of temperature after the injection of Ringer's solution is said to be due to the liberation, under the influence of excess sodium ions, of substances which affect the heat-regulating centre.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

SUGAR AND DIABETES

2219. Enzyme Formation. H. Staub (*Helv. Chim. Acta*, 1921, **4,** 281-7).—In order to obtain information regarding carbohydrate metabolism, the author uses the "blood-sugar curve," obtained by determining the percentages of sugar in the blood at intervals and plotting the results as ordinates against times as abscissæ. It is found that ingestion of carbohydrate is followed by enhanced assimilation of glucose, whereas, if carbohydrate food is stopped for some time, the capacity for assimilating dextrose is depressed. These results, which are regarded as due to sufficiency or lack of what are named "assimilation enzymes," are discussed in their relation to the formation of enzymes in the human organism.—W. D. H. (*J. C. Soc.*).

2220. Foie, plasma sanguin et sucre protéidique. H. Bierry and F. Rathery (*Compt. rend.*, 1921, **172,** 1445-7).—Analysis of the portal blood and of the blood leaving the liver in dogs shows that in passing through the liver the blood has its percentage of sugar combined with protein roughly halved, whereas the ratio of nitrogen to sulphur in the plasma is increased by about 50%. The authors conclude that the plasma undergoes a qualitative and quantitative alteration in the liver, sugar being set free from its combination with protein. They have previously shown that in the passage through the liver the free sugar is increased in amount, while the "protein sugar" is diminished. —J. A. M.

2221. Über die Rolle der Säure im Kohlenhydratstoffwechsel. IV. Die Beziehungen von Säure und Alkali zur Adrenalinglykosurie. H. Elias and U. Sammartino (*Biochem. Zeit.*, 1921, **117,** 10-40).—Glycosuria induced by injection of acids in the rabbit is not accompanied by a congestion of the liver such as occurs in piqûre or adrenaline glycosuria, although subcutaneous administration of adrenaline also causes a marked acidosis (reduced titratable blood alkalinity) and a 3-fold increase in the lactic acid content of the liver. The sugar mobilisation caused in the perfused tortoise liver by adrenaline is inhibited by alkali and restored by acid. Perhaps the acidosis caused by adrenaline plays a similar part in the causation of glycosuria in the mammal.—C. L. E.

2222. Über die Identifizierung der aldehydartig reagierenden Substanz im Harn von Diabetikern als Acetaldehyd. W. Stepp and R. Feulgen (*Zeit. physiol. Chem.*, 1921, **114,** 301-6).—The blood and urine of diabetics contain acetaldehyde. This appears in the urine only during acidosis. It is not found in all cases, but in many as much as 30 to 50% of the usual "total acetone" consisted of acetaldehyde. It has been identified by means of its compound with dimethylhydroresorcine ("Dimedon"—used by Neuberg for isolating acetaldehyde in alcoholic fermentation).—H. W. D.

2223. Du mode d'action des régimes anhydrocarbonés chez les diabétiques. H. Chabanier, M. Lebert, C. Lobo-Onell (*Compt. rend. soc. biol.*, 1921, **85,** 2-4).—The authors consider that the severity of a diabetic's condition may be gauged by the height at which the blood-sugar percentage must be maintained in order that he may be free

from acetonuria. When a carbohydrate-free diet is given, there is no real improvement in his condition unless the acetonuria (which ensues if the blood-sugar falls) gradually passes off.—J. H. B.

2224. Massive Doses of Alkali in Two Cases of Impending Diabetic Coma. W. E. Cary (*J. Amer. Med. Assoc.*, 1921, **76,** 1393-5).—In the precoma state, when the plasma alkali reserve is below 20% (in the cases dealt with about 14%), rapid administration of enough sodium bicarbonate to raise the alkali reserve to 30% or even higher is attended with immediately beneficial effects. Alkalisation of the urine was avoided. It is best to give the bicarbonate by the mouth, but in emergencies rectal or intravenous administration may be used.—C. L. E.

2225. Un cas de diabète maigre. L. Ambard and H. Lux (*Compt. rend. soc. biol.*, 1921, **84,** 955-7).—Report of a case of diabetes showing a high degree of glycosuria with very slight hyperglycæmia, a leak point which did not rise with increase of hyperglycæmia, and a persistent acetonuria in spite of increase in the blood-sugar to 0·4%.—J. H. B.

2226. Quantitative Tests for Diabetic Urine. M. Claudius (*Hospitalstidende.*, 1921, **64,** 97).—Acetone, aceto-acetic acid, oxybutyric acid, and glucose can be oxidised at 100° C. by iodic acid in sulphuric acid solution, the requisite concentration of the latter being different for each of these substances. The iodine set free is estimated volumetrically.—C. L. E. (*A. M. A.*).

KIDNEY AND URINE

2227. Über das Schicksal der erstgeformten Harnkanälchen der bleibenden Niere beim Menschen. O. F. Kampmeier (*Arch. f. Anat.*, 1920, **1919,** 204-26).—A description of uriniferous tubules which appear during the development of the kidney, but are ultimately reabsorbed. They appear to give rise to renal cysts.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2228. Die Regulation der renalen Wasserausscheidung im Rahmen des ganzen Wasserhaushaltes. C. Oehme (*Arch. exp. Path. Pharm.*, 1921, **89,** 301-31).—The author investigated the time relations of a water diuresis produced by drinking water when the previous period had been one in which water was withheld and when water was freely given beforehand. The diuresis is quicker in the second case. He determined that this cannot be due either to the condition of the circulation, nervous influences, or the action of hormones, and considers that it must be due to a difference in the metabolism of the kidney itself. He thinks that the previous metabolic history of the kidney tissue is an important factor governing kidney function.—J. H. B.

2229. Le rendement urinaire (rapport du débit urinaire au débit sanguin) comme estimation du travail rénal. Influence du système nerveux sur le rendement urinaire. P. Carnot, F. Rathery, and P. Gérard (*Compt. rend. soc. biol.*, 1921, **84,** 960-3).—The authors perfuse the kidneys of a living dog. They determine the ratio between the amount of a substance (glucose, urea, or water) excreted in a given time, and the percentage in the blood. This ratio is the "rendement." It affords a more accurate idea of the work done by the kidney than a mere determination of the absolute amount excreted. The "rendement" changes very considerably if the vagi are cut, or the animal is killed. Under the conditions of their technique, these changes can only be due to removal of nervous influences. Hence they think secretory nerves to the kidney exist.—J. H. B.

2230. Arrêt initial de la sécrétion urinaire provoqué par les injections intravasculaires de solutions hypertoniques de saccharose. E. Wertheimer et C. Dubois (*Arch. intern. de*

physiol., 1921, **16**, 307-24).—L'injection d'une solution hypertonique de saccharose produit souvent, comme effet initial, un arrêt ou un ralentissement de la sécrétion urinaire, à un moment où la pression artérielle augmente fortement, en même temps que le volume du rein. Ce fait ne se concilie pas avec la théorie de la filtration et s'explique, selon les auteurs, par la perte d'eau que fait subir aux éléments sécréteurs du rein le pouvoir osmotique du sang, subitement accru.—L. F.

2231. Hippuric Acid Synthesis Test. P. L. Violle (*Lancet*, 1921, i., 1239).—The importance of this test in investigations of renal inefficiency (Abstract No. 881, Vol. V., p. 138) is again advocated as of clinical value in relation to conditions such as arterial hypertension which are the result of kidney failure.—W. D. H.

2232. A Test for Early Renal Insufficiency. T. B. Magarth (*J. Lab. and Clin. Med.*, 1921, **6**, 463-8).—The test is based upon the observation that even a slight lesion of the kidney interferes quite early with the ability of that organ to excrete uric acid. The patient's uric acid output on a purine-free diet is first determined. Uric acid or caffeine citrate is then administered by the mouth, and the uric acid in the blood is estimated soon after and 24 hours later. The uric acid excreted during the 24 hours is also determined. From these observations the ability of the kidneys to excrete uric acid is ascertained. The method of Folin and Wu was used for estimating uric acid.—D. H. de S.

2233. The Influence of the Nervous System on the Excretion of Creatinine. A. A. Weinberg (*Biochem. J.*, 1921, **15**, 306-11).—Muscle tonus is not the main factor in excretion of creatinine. The condition of the tracts between cerebrum and muscles influences the urinary creatinine. An important influence on excretion of this substance must be assigned to the nervous system.—J. A. H.

2234. Über einen aus normalem Menschenharn durch Behandlung mit p-Dimethylaminobenzaldehyde erzeugten, rein dargestellten roten Farbstoff. P. Hári (*Biochem. Zeit.*, 1921, **117**, 41-54).—The physical and chemical properties of the pure substance, of which 0·02 to 0·06 grm. was obtained from 10 litres of urine, are described. It appears not to be identical with the substance produced in Ehrlich's reaction.—C. L. E.

2235. Pentose in Urine. E. Justin-Mueller (*J. pharm. chim.*, 1921, **23**, 317-21).—In a case of pentosuria, the urine was optically inactive, but reduced Fehling's solution, and when heated with HCl gave reactions for furfuraldehyde. Indoxyl and scatole pigments in urine interfere seriously with furfuraldehyde tests.—W. D. H. (*J. C. Soc.*).

SKIN

2236. Some Effects of Hot Baths on Man. H. C. Bazett and J. B. S. Haldane (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55**, iv-v).—By immersion up to the neck in a bath in which the water was kept circulating at a constant temperature, the body temperature can be kept steady, or made to rise at any desired rate. In baths below 37° C. respiration was unaffected, pulse-rate rose slightly, systolic and diastolic pressures fell 10 to 20 mm. Hg, and venous pressure seemed to be increased. Diuresis was striking, but the normal rate was resumed after some hours. In baths above 37° C. sweating began at a mouth temperature of 37·2° C. During rapid rise of temperature hyperpnœa occurred, accompanied by faintness, mental confusion, and tingling, considered to be due to oxygen want caused by over-stability of oxyhæmoglobin resulting from acapnia. The urine became alkaline and devoid of NH_3, but contained much bicarbonate and some acetone bodies. Sweat was also alkaline. Heat applied in this way makes the respiratory centre more sensitive to CO_2. Hæmoglobin estimations showed a rise.—J. A. C.

2237. Sui rapporti tra l'innervazione cerebrale e l'innervazione spinale della secrezione del sudore. G. A. Pari (*Gazz. d. osp. e. d. clin.*, 1920, **41**, 834-7).—In the cat there is a centre for sweat secretion in the cerebrum which sends out tracts to the periphery via medulla and spinal cord, and also subsidiary centres in the cord itself. (Compare Abstract No. 176, Vol. VI., p. 26.)—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2238. Influence of the Electric Current on Drug Absorption. O. Inchley (*Proc. Roy. Soc. Med.*, 1921, **14**, Sect. of Ther., 17).—Absorption does occur through the skin of rabbits, cats, and guinea-pigs under the influence of what is generally called cataphoresis. This was ascertained either by noting the physiological effects, or by actual chemical analysis in relation to aconitine, strychnine and other alkaloids, calcium and iron salts, the salicylate and ferricyanide ions, etc. The penetration is very superficial, and usually small in comparison with what occurs on hypodermic injection.—W. D. H.

2239. Beiträge zur Anatomie und Biologie der Haut. III. Bau des Deckepithels (II.), Epithelregeneration, Atrophien und Hypertrophien des Deckepithels. Sklerodermie. W. Frieboes (*Dermat. Zeit.*, 1921, **32**, 1-11).—Histological investigations along the lines indicated in the title. The important part played by the subepithelial connective tissue during skin regeneration is pointed out, and the dependence of the condition of the skin on internal secretions is shown. A new classification of skin diseases is suggested, the distinguishing factor being the layer in which pathological changes have manifested themselves.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2240. Über den Einfluss der Bodenfarbe auf die Fleckenzeichung des Feuersalamanders. K. v. Frisch (*Biol. Zentralbl.*, 1920, **40**, 390-414).—Polemical. Contains an account of further experiments on the effect of yellow, white, and black surroundings on the pigmentation of salamander larvæ; the results agree with those of Kammerer. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

ENDOCRINE SYSTEM

2241. The Experimental Production of Thyroid Hyperplasia in Dogs. E. Mellanby and May Mellanby (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55**, vii-viii).—When puppies received cod-liver oil as the only fat in the diet, the thyroids were small and normal in appearance. With other fats there was always some hyperplasia as compared with those of the cod-liver oil puppies. When butter was the fat eaten, the hyperplasia was marked. Increasing the fat of the diet intensified the hyperplasia. Confinement and living indoors, together with a large diet, especially one containing abundant fat (other than cod-liver oil), produced great hyperplasia.—J. A. C.

2242. Experiments on Dogs' Thyroids in Relation to the Treatment of Exophthalmic Goitre. E. Mellanby and May Mellanby (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55**, x). —The diet was arranged so that it contained only a small amount of fat, and to this was added 15 c.c. of cod-liver oil per diem. The foodstuffs eaten were separated milk powder, porridge, bread, green vegetables, eggs, and lean meat. The metabolism of the patients was reduced, and they gained weight, the other symptoms being mitigated. Working on the assumption that the action of cod-liver oil was wholly or in part due to its iodine content, 6 to 9 grains of potassium iodide were in some cases given to the patients. After a period of this treatment, resulting in reduced metabolism, the weight of the patient became stationary or fell slightly.—J. A. C.

2243. Recherches sur la composition chimique du corps thyroïde. E. Zunz (*Arch. intern. de physiol.*, 1921, **16**, 288-306).—Nombreux tableaux sur la composition chimique du corps thyroïde, notamment sur sa teneur en iode (0·23, 0·56 jusqu'à 0·68 pour mille de substance fraîche).—L. F.

2244. Effect of Thyroxin on Growth in White Rats. A. T. Cameron and J. Carmichael (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** v).—Thyroxin, when given by mouth, produces decrease of growth-rate in rats; hypertrophy of heart, liver, kidneys, and adrenals; and decrease of growth-rate of thyroid. Quantitatively, compared on a basis of iodine content, the effects of thyroxin are distinctly less than those of desiccated thyroid. This is probably due to bacterial decomposition; thyroid acts as a shield. —J. A. C.

2245. Il cervello e la funzione tiroidea. C. Ceni (*Riv. sperim. di freniatr.*, 1920, **44,** 243-86).—In tortoises removal of one cerebral hemisphere produces no apparent change in the thyroid, but in birds and also in a certain number of the dogs experimented upon a hypertrophy of the gland occurred as a result of the operation. It is suggested that, in general, vertebrates possess an inhibitory centre for the thyroid in the fore-brain.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2246. Ricerche sperimentali riguardanti l'influenza della tiroide sulla formula leucocitaria del sergue a proposito della linfocitosi dei Basedowiani. G. Baggio (*Arch. per le scienze med.*, 1920, **43,** 93-127).—Removal of the thyroid in rabbits leads to no alteration in the blood-picture. The external parathyroids were left intact.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2247. Über die Wirksamkeit der menschlichen Schilddrüse in Froschlarvenversuch. C. Wegelin and J. Abelin (*Arch. exp. Path. Pharm.*, 1921, **89,** 219-51).—An account of feeding experiments on tadpoles undertaken with human thyroid gland from (1) normal subjects, (2) new-born infants, (3) parenchymatous and colloid goitres, (4) adenomata, and (5) a case of Graves' disease. A positive effect of the usual type was obtained with (1), (5), and some of (3) and (4). Thyroid gland from new-born infants was inactive. It is noteworthy that tissue definitely adenomatous was active.—J. H. B.

2248. Kalkstoffwechsel und Blutkalkuntersuchungen in einem Falle von Tetania parathyreopriva und dessen medicamentöse Beeinflussung. J. G. Klein (*Deutsch. Arch. f. klin. Med.*, 1921, **135,** 161-72).—In this case there was a considerable Ca retention, which increased with the progress of the tetany. Parathyroid gland, therapeutically given, effected a slight increase of the Ca retention. The thyroid gland had a better effect. The Ca content of the blood showed without medication normal values, but was increased considerably by treatment with Ca lactate.—H. W.

2249. Tetanie nach Entfernung der Epithelkörperchen und Calciummangel im Blute. P. Trendelenburg and W. Goebel (*Arch. exp. Path. Pharm.*, 1921, **89,** 171-99).—The authors use the isolated frog heart to estimate the concentration of Ca-ions in serum. Serum from normal cats produces a greater contraction than that from thyro-parathyroidectomised cats. Addition of Ca to the latter increases the contraction of the size produced by normal serum. Serum from cats with tetany was ashed, and the ash dissolved and administered to a frog heart. Again the contraction produced was less than that produced by normal serum similarly treated. Proof is thus obtained of a Ca deficiency in the blood in tetany.—J. H. B.

2250. The Internal Secretion of Sandstroem's Glands. Parathyroid Hypofunction and Eclampsia. A. C. Massaglia (*Endocrin.*, 1921, **5,** 309-24).—The parathyroid glands appear to have the function of neutralising or of breaking down into waste products of simpler chemical constitution complex substances due to metabolic changes, or toxic substances derived from pregnancy and puerperium, from the intestine, and from muscular fatigue. An intoxication from a parathyroid hypofunction injures the kidneys, the liver, and the nervous system. There exists between the liver and the parathyroids an indirect correlation in neutralising toxic substances which arise from the intestine. A parathyroid hypofunction in pregnancy or in puerperium is then certainly a pathogenic factor of eclampsia.—S. V.

2251. Adrenal Insufficiency. G. N. Stewart (*Endocrin.*, 1921, **5,** 283-306).—A review of literature dealing with the evidence (experimental and clinical) for the existence of adrenal insufficiency. The attempts made to evoke in animals a well-marked syndrome characteristic of adrenal deficiency have been singularly disappointing. The clinical evidence is subjected to a scathing, but well-deserved, criticism.—S. V.

2252. Die Veränderungen des weissen Blutbildes nach Adrenalin-Injectionen. G. Walterhöfer (*Deutsch. Arch. f. klin. Med.*, 1921, **135,** 208-23).—Subcutaneous and intravenous injections of adrenaline regularly cause a temporary leucocytosis. The lymphocytes increase in the first 30 min. and then decrease. The augmentation of neutrophile leucocytes occurs more slowly, and lasts longer. The phenomenon is the same in health and in most diseases. The actual increase varies, but is independent of histological changes in the organs. This leucocytosis is a real increase of the white corpuscles.—H. W.

2253. The Dangers of Pituitary Extract. M. P. Rucker and C. C. Haskell (*J. Amer. Med. Assoc.*, 1921, **76,** 1390-3).—Clinical evidence from obstetric cases in which all the indications for the use of the extract were favourable, nevertheless indicate that its use is accompanied by danger to both mother and child. The commonest ill-effects were perineal lacerations, uterine rupture, asphyxia, and intracranial hæmorrhage. There is, further, the risk of heart failure, and the fact that the normal rhythmic contractions are replaced by an obstinate condition of tone in which the intra-uterine pressure is abnormally high.—C. L. E.

2254. Oral Administration of Pituitary Extracts. P. Hamill (*Proc. Roy. Soc. Med.*, 1921, **14,** Sect. of Ther., 17-19), M. Donaldson (*ibid.*, 19-20).—In anæsthetised or decerebrate animals small doses *per os* caused, after absorption, increase of uterine and intestinal activity; no effect on blood-pressure was noted, and diuresis was not investigated. Pituitrin is soon destroyed by pancreatic juice; this and the fact that the above effects occur after ligature of the pylorus, or resection of the intestine, render it probable that the drug is absorbed by the stomach. Observations in man confirm these views, and this part of the subject is dealt with more fully in the second paper, the author having found pituitrin by the mouth is valuable in treating cases of uterine hæmorrhage.—W. D. H.

2255. Hypopituitarism: Froelich Type in an Infant Nine Months Old. M. B. Kay (*Endocrin.*, 1921, **5,** 325-7).—The case is reported because of the extremely early age of occurrence. The pituitary element preponderated.—S. V.

2256. Sull' attivita secretiva della preipofisi in gravidenza. A. Gentili (*Sperimentale arch. di biol.*, 1920, **74,** 286).—In large part confirmation of known facts. The *pars anterior* progressively increases in cows from the beginning to the end of pregnancy. The weight of the hypophysis in nulliparous cows is 135 to 140 mgm., at the beginning of pregnancy 170 mgm., at the end 350. In multiparous cows it may weigh 460 mgm. In these animals the *pars anterior* is excellent material for the "gravidic" cells, whose function is to secrete lipoid substances, possibly phosphatides. During pregnancy also the chromophobe cells appear to secrete great amounts of colloid.—J. A. H. (*Med. Sci.*).

2257. Action d'extraits et produits dérivés d'organes à sécrétion interne sur l'utérus isolé, particulièrement après la castration totale. M. Athias (*Arch. internat. pharm. et ther.*, 1921, **25,** 423-52).—A confirmation of the results of previous workers on the response of the isolated uterus of different species to extracts of the pituitary and suprarenal glands. Rhythmic contractions disappear after castration, but otherwise the behaviour is normal after this operation. A reversal of the adrenaline effect after pituitary was not obtained.—J. H. B.

REPRODUCTIVE SYSTEM

2258. Influence of Food on Reproduction in the Domestic Fowl. R. Pearl and T. E. Fairchild (*Amer. J. Hyg.*, 1921, **1**, 253-77).—A flock of 60 birds were allowed free access to 12 different common foods; a similar flock was fed according to the system of the Maine Agric. Expt. Stat., supposed to give excellent results by practical poultry-men. In both sets egg production and gain in weight were excellent, but equal. The free choice birds ate more whole grain, and less milled products than the others. They also consumed 33·4 protein, 33·7 fat, and total calories 8·4% less than the fowls on the strict diet. They took rather more carbohydrates. Hence, free feeding is economical, and leads to a better physiological utilisation of diet.—W. D. H.

2259. Recherches sur la toxicité du milieu intérieur des batraciens urodèles vis-à-vis de leurs œufs. A. Weber (*Compt. rend.*, 1921, **172,** 1249-51).—The fertilised eggs of Triton introduced into the body cavity of an adult Triton are killed, in the male in 5 minutes, in the female in about 10 minutes. The toxicity of the peritoneal cavity for the ova disappears gradually when the animals are kept in captivity. Introduction of successive batches of eggs also renders the cavity non-toxic. In the latter case the eggs are believed to absorb the toxic substance.—J. A. M.

2260. Sur la signification fonctionnelle des sécrétions epididymaire et déférentielle. J. Benoit (*Compt. rend. soc. biol.*, 1921, **84,** 951-2).—In mice, a secretion derived from the vas deferens is essential for the normal nutrition of spermatozoa. Secretion from the epididymis is not adequate by itself. The state of affairs in higher mammals is different.—J. H. B.

2261. Procédé de diagnostic individuel du sang et du sperme. Dervieux (*Compt. rend.*, 1921, **172,** 1384-6).—Serum is obtained from a rabbit which has been inoculated with human seminal fluid. The serum precipitates (1) human seminal fluid, (2) seminal fluid from the original source in greater dilution than fluid from another human source, (3) human serum in greater dilution than is the case with rabbit's serum after inoculation with human blood, (4) male human serum in greater dilution than female, (5) human serum from the same source as the original seminal fluid in greater dilution than serum from another human source.—J. A. M.

2262. I. Formation de la couche corticale définitive et origine des œufs définitifs dans l'ovaire de chatte. II. Couche corticale définitive au hile de l'ovaire et pseudonéoformation ovulaire. H. de Winiwarter (*Compt. rend. soc. biol.*, 1920, **83,** 1403-5, 1406-8). I. Further observations in support of the author's view that in the cat the original ovum-producing layer degenerates and is replaced by a new (third) ingrowth from the germinal epithelium. Details of the oögenesis in this layer are recorded. II. An account of further ingrowth of epithelium near the hilus of the cat's ovary which, however, fails to give rise to ova.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2263. Changement expérimental du sexe chez le Triton alpestris. C. Champy (*Compt. rend.*, 1921, **172,** 1204-7).—Two male Tritons, reduced to a sexually neutral condition by starvation, and then well fed, took on the external characteristics of females. One was killed, and found to have fatty bands, with scattered indifferent spermatogonia, in place of testes. The other was killed 3 months later, and was found to possess ovaries lying medially to the degenerated testes. This observation is contrary to theories of the predeterminism of sex.—J. A. M.

2264. Physiological Properties of the Gonads. IV. Gonad Transplantation in the Guinea-pig. C. R. Moore (*J. Exp. Zool.*, 1921, **33,** No. 2).—Ovaries grafted into young castrated male guinea-pigs persist for 6 to 9 months. Upon recovery, the microscope shows Graafian follicles. The mammary glands resemble those of a pregnant female. The animals, however, gave no indication of maternal inclinations towards young

ones. Testicular tissue grafted subcutaneously or intraperitoneally into female guinea-pigs may be found in a healthy, growing condition several months later, though differing considerably from normal. In some grafts a considerable amount of germinal epithelium of the tubules is retained, many of the cells possessing mitotic figures; usually in mammalian testicle grafts only Sertoli cells persist. In some grafts spermatogenesis continues for a certain period, but mature spermatozoa are not present. Somatic modifications, associated with the testis graft, consists of changes in the external genitalia. The clitoris undergoes hypertrophy. Toward other females and males it reacts as a typical male. There is no indication of an antagonistic action between secretions from the opposite adult sex glands.—W. D. H. (*W. I.*).

2265. Glande interstitielle du testicule et caractères sexuels secondaires chez les poissons. R. Courrier (*Compt. rend.*, 1921, **172,** 1316-7).—In the male stickleback the secondary sexual characteristics appear at the middle of April. At this time the formation of spermatozoa has ceased, and the interstitial cells of the testis show indications of secretory activity.—J. A. M.

2266. Nouvelles observations sur la castration partielle. A. Lipschutz, B. Ottow, and C. Wagner (*Compt. rend. soc. biol.*, 1921, **85,** 42-3).—See Abstract No. 1910, Vol. VI., p. 275.—J. H. B.

2267. Sur un prétendu tissu interstitiel dans le testicule des batraciens urodèles. C. Pérez (*Compt. rend.*, 1921, **172,** 1443-5).—The tissue in the testis of Triton, described as interstitial cells by Champy (see Abstract No. 989, Vol. VI., p. 149), has nothing in common with the interstitial cells of the mammalian testis. It is due to phagocytic changes in the proper testicular tissue.—J. A. M.

2268. Bemerkungen zur normalen und pathologischen Histologie der Zwischenzellen des Menschen und der Säugetiere. C. Benda (*Arch. f. Frauenk. u. Eugenet.*, 1921, **7,** 30-40).—A criticism of Steinach's views. Homosexual testes do not contain both male and female interstitial elements, nor, indeed, does the human ovary contain interstitial cells at all comparable to those of the testis. Neither do the male interstitial cells multiply during so-called rejuvenescence; they show great differences in the extent of their development in various mammals, and are to be regarded merely as depots for reserve materials.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2269. Über die Tätigkeit des Ovariums in der Schwangerschaft (interstitielle Zellen). O. Fellner (*Monatsschr. f. Geburt. u. Gynakol.*, 1921, **54,** 88-95).—A description of the method of isolation from the interstitial cells of the ovary and of the corpus luteum of a lipoid, the injection of which produces similar effects to those observed after administration of ovarian extracts. The relative concentration of this lipoid in these tissues in various phases of activity is investigated.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

PHARMACOLOGY

2270. A New General Anæsthetic. R. L. M. Wallis and C. L. Hewer (*Lancet*, 1921, i., 1173-8).—In examining the impurities in ether with a view to getting a better product, it was found that the harmful ones were aldehydes and mercaptans; further purification separated out ketones in small quantities, after which the pure ether lost its anæsthetic properties, and became a mere intoxicant. (Compare Lumbard, *Amer. J. Surg. Anæsth.*, 1920, **34,** 118.) When the ketones were restored, once more the ether regained its anæsthetic characters. A new anæsthetic prepared from the ketones themselves is safer than ether or chloroform, and destitute of unpleasant effects. In this short paper many details of preparation are omitted, but it is desirable that these should be supplied, in spite of the fact that the new anæsthetic under the name

" Ethanesal " is now in commercial hands. Details of its clinical usefulness are given in full.—W. D. H.

2271. Recherches relatives à l'action de l'alcool éthylique sur l'organisme. V. Ducceschi (*Arch. ital. de biol.*, 1920, **70,** 93-114).—See Abstract No. 2027, Vol. V., p. 323.—W. D. H.

2272. The Pharmacology of Acetone. W. Salant and N. Kleitman (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 202-4).—Intravenous injection of acetone into cats produces a fall of blood-pressure due to cardiac depression. Periods of apnœa occur, and Cheyne-Stokes respiration was frequently observed after repeated injections. In dogs the effects on respiration were not constant, but the heart's action became slower owing to an action on the vagus centre; 10%, and sometimes 5%, acetone in Ringer's fluid, perfused through the isolated heart of the frog, arrests the heart, but the heart subsequently recovers.—D. H. de S.

2273. Le pétrole dans le traitement de la fièvre récurrente et de la trypanosomiase. R. Van Saceghem (*C. r. de la soc. belge de biol.*, 1921, 11-12).—L'administration per os d'une cuillerée à soupe dé pétrole matin et soir pendant quatre jours consécutifs guérit très souvent la fièvre récurrente chez l'homme. Per os le pétrole agit comme purgatif chez les animaux atteint de trypanosomiase, sans avoir d'autre effet. Par voie intraveineuse, le pétrole est bien toléré; il n'a plus d'action purgative, mais parait favoriser la multiplication des trypanosomiases dans le sang des bovidés.—E. Z.

2274. A Simple Oxygen Bed Tent. L. Hill (Proc. Physiol. Soc., *J. Physiol.*, 1921, **55,** xx-xxi).—A tent oxygen chamber to enclose the upper part of the patient when in bed; can be put up or taken down in a few minutes, and is very easy to run. The beneficial result of treatment with oxygen in the tent is illustrated by details of a case of œdema and chronic ulcer of the leg.—J. A. C.

2275. Pharmacological Action of Lead in Organic Combination. E. C. Mason (*J. Lab. and Clin. Med.*, 1921, **6,** 427-53).—Triethyl lead and salts of triethyl lead stimulate the medulla, pons, mid-brain, and perhaps certain portions of the cerebellum and cerebrum, the chief objective symptom being convulsions. The blood-pressure falls after the first injection of the compound, but rises after all subsequent injections. The fall in pressure is probably due to stimulation of the cardio-inhibitory centre, dilatation of the vessels of certain viscera—*e.g.*, kidney and spleen—and a direct depressant action on the heart. The rise in pressure after the second or subsequent injection is due to constriction of the vessels of the kidney, spleen, and possibly other organs; stimulation of the cardio-accelerator and augmentor centres; and general convulsions if these are present; the rise may, however, occur in absence of the last. Respiration is stopped by the first injection, and greatly increased by subsequent injections, these results being due to action on the respiratory centre, and not to action on the bronchial muscles. There is increased intestinal activity, probably the result of medullary stimulation, which thus indirectly increases the activity of the vagus nerves.—D. H. de S.

2276. Le salicylate de soude en injection intraveineuse. R. Lutembacher (*Compt. rend. soc. biol.*, 1921, **84,** 921-3).—It is recommended that sodium salicylate be injected intravenously in rheumatic infections to avoid gastric disturbances.—J. H. B.

2277. Blood Bicarbonate Levels following Administration of Sodium Bicarbonate. S. P. Reiman and H. A. Reiman (*J. Biol. Chem.*, 1921, **46,** 493-8). **Comparison of Blood and Lymph Bicarbonate after Intravenous Injection of Sodium Bicarbonate.** S. P. Reiman and M. D. Sauter (*ibid.*, 499-502).—In the first paper the Palmer and Van Slyke's formula for the estimation of the rise in blood bicarbonate following the administration of sodium bicarbonate is found to be accurate for normal individuals, but is less accurate in various diseases. In the second, bicarbonate is found to leave

the blood at a remarkably rapid rate, so that the concentration in both fluids increases at the same rate.—H. E. R.

2278. Cocaine and the Behaviour of Rats. D. I. Macht and W. Bloom (*Arch. internat. pharm. et ther.*, 1921, **25,** 380-90).—Cocaine has no stimulant but only a depressant effect on cerebral activity.—J. H. B.

2279. Über den Synergismus von Atropin und Blutserum am muskarin-vergifteten Froschherz. H. Kirste (*Arch. exp. Path. Pharm.*, 1921, **89,** 106-10).—The author produces a muscarine standstill in frog hearts attached to a Straub cannula with a dilution of muscarine of known strength. He then determines the least quantity of atropine dissolved in Ringer's solution which will restart the beat. He finds that if the atropine is dissolved in serum, in certain cases the necessary amount of atropine may be reduced 200 times. Serum alone can restart the beat if suitable samples are obtained. Serum shaken with charcoal and Ca free has not this property.—J. H. B.

2280. Sur l'action cardiaque des substances du groupe de la quinoléine—II. H. Fredericq et E. F. Terroine (*Arch. intern. de physiol.*, 1921, **16,** 325-42).—II. Quinoléine, quinaldine, lépidine, orthotoluquinoléine, thalline, paraméthoxyquinoléine, tétrahydroquinoléine. L'action sur le cœur isolé de la quinoléine, de la quinaldine, de la lépidine, de l'orthotoluquinoléine, de la paraméthoxyquinoléine, de la tétrahydroquinoléine et de la thalline est qualitativement très semblable à celle précédemment décrite par H. F. et E. F. T., de la quinine, de la quinidine, de la cinchonine et de la cinchonidine. Les doses faibles diminuent soit la fréquence, soit la contractilité, soit les deux à la fois et provoquent parfois des arythmies, extrasystoles, bigéminie, blocs incomplets, etc. Les doses fortes arrêtent le cœur en diastole ou demi-diastole. La toxicité comparée de ces substances permet un classement d'où il ressort: (*a*) Que la présence du groupe méthyle augmente la toxicité, la position de ce groupement étant sans influence; (*b*) que la présence d'un groupe méthoxyle augmente la toxicité alors qu'elle la diminue dans le cas de la cinchonine et de la cinchonidine; (*c*) que l'hydrogénation de la molécule augmente la toxicité.—L. F.

2231. Pharmacology of Cinnamein, Benzyl Succinate, and Benzyl Nitrite. D. I. Macht (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 177-9).—Cinnamein produces much the same effects as benzyl benzoate, but is more toxic and irritant to the stomach. Benzyl succinate is of the same toxicity as benzyl benzoate; its action is milder, but the effects are of longer duration owing to the slow breaking up of the drug. Benzyl nitrite produces typical benzyl effects on smooth muscle, and causes a rapid and prolonged fall of blood-pressure, due to vaso-dilatation. Its toxicity is not very great. It is being tried in the treatment of cases of hypertension.—D. H. de S.

2282. The Pharmacology of Some Benzyl Esters. C. Nielsen and J. A. Higgins (*J. Lab. and Clin. Med.*, 1921, **6,** 388-92).—Injections of benzyl benzoate and benzyl cinnamate cause relaxation of the intestine, greater in the case of benzyl cinnamate. The latter substance lowers the blood-pressure less than does benzyl benzoate. After repeated injections of large doses of benzyl esters into the blood-stream, the arterial blood becomes very venous in appearance, but the coagulation time is unaltered.—D. H. de S.

2283. Contributo allo studio farmacologico dell' emetina. P.-M. Niccolini (*Arch. internat. pharm. et ther.*, 1921, **25,** 453-72).—The pharmacology of emetine.—J. H. B.

2284. La caféine, poison paralysant du sympathique. H. Frédericq et A. Descamps (*Compt. rend. soc. biol.*, 1921, **85,** 13-14).—H. Frédericq a montré, en 1913, que la caféine paralyse chez le chien les nerfs accélérateurs du cœur contenus dans l'anneau de Vieussens. Les expérience actuelles de Frédericq et Descamps démontrent que chez le lapin, la caféine supprime l'excitabilité des filets vasoconstricteurs de l'oreille et des filets pupillodilatateurs qui empruntent la voie du tronc sympathique cervical.—E. Z.

2285. Sur l'action diurétique de l'allylthéobromine. C. Heymans (*Le Scalpel*, 1921, **74,** 592-6).—L'allylthéobromine, même seule, est un antihydropique à action rapide, même en cas de néphrite. L'action diurétique est surtout marquée quand chez des cardiaques présentant des œdèmes, on l'administre en association avec la digitale. L'injection sous-cutané est légèrement douloureuse; ajoutons qu'elle peut même déterminer une réaction assez forte chez des malades à circulation locale trop défectueuse. L'injection intramusculaire, dans le deltoïde ou mieux encore dans le fessier, est mieux supportés que l'injection hypodermique; en injectant une solution moins hypertonique, on éviterait probablement toute réaction locale. L'injection intraveineuse doit évidemment être réservée aux cas exceptionnels. Rien ne peut cependant, pas plus les unes que les autres ne permettent dès maintenant de dire si l allylthéobromine peut remplacer la théobromine dans la thérapeutique de l'hypertension artérielle contre laquelle l'efficacité de la théobromine est reconnue.—E. Z.

2286. Über die Wirkungsweise des β-Imidazolyläthylamins (Histamin) auf den menschlichen Organismus. P. Schenck (*Arch. exp. Path. Pharm.*, 1921, **89,** 332-9).—Subcutaneous injection of histamine in man causes great vascular dilatation, especially in the head and splanchnic region. The diastolic blood-pressure is very low. All phenomena produced can be rectified through simultaneous administration of adrenaline. He states that 15 mg. histamine and 1·5 mg. adrenaline can be safely injected at the same time.—J. H. B.

2287. Nitrite d'amyle et réactions vasculaires. G. Richard (*Arch. des malad. du cœur. des vaiss. et du sang*, 1920, **13,** 416-26).—A study of the effects of amyl nitrite on blood-pressure and, through the vagus centre, on the heart in the normal subject and in patients with arterio-sclerosis. The action of the drug is useful in distinguishing subjects with preponderating cardio-inhibitory from those with pronounced cardio-accelerator tone.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2288. The Relation between the Blood-coagulating and the Smooth Muscle-contracting Properties of Tissue Extracts. C. A. Mills (*J. Lab. and Clin. Med.*, 1921, **6,** 374-88).—Extracts of fresh normal tissues, injected intravenously into dogs, caused intravascular clotting and contraction of smooth muscle. Injection of a crude preparation of antithrombin, obtained from lung tissue by removing the phospholipins, did not cause clotting, but the bronchioles contracted and the blood-pressure fell. Similar results were obtained on injection of the albumins of lung extracts. These results are supposed to be due to the presence of histamine or histamine-like substances. A purified antithrombin solution caused no fall in blood-pressure, but a gradual bronchiole contraction, possibly due to a specific action of the antithrombin. Purified active coagulant solutions caused both clotting and bronchiole contraction, and if they were so treated that they had no action on the blood, then also they had no action on the bronchioles. It is presumed that any substance which causes rapid intravascular clotting produces contraction of smooth muscle if injected suddenly in sufficient quantity into the circulation.—D. H. de S.

2289. Hæmostatic Agents. H. C. Hamilton (*J. Lab. and Clin. Med.*, 1921, **6,** 398-404).—The author restates and expands what he has already written on this subject (*cf.* Abstract No. 1840, Vol. V., p. 290). He considers that the activity of hæmostatic serum in reducing the coagulation time of blood can now be regarded as a matter belonging to the domain of established facts.—D. H. de S.

TOXICOLOGY

2290. I. Bestimmung des Broms in kleinsten Mengen. II. Gibt es eine spezifische Wirkung der Bromsalze? E. Oppenheimer (*Arch. exp. Path. Pharm.*, 1921, **89**, 17-45).—A method of estimating a solution containing bromide by liberating bromine with chlorine, and comparing the colour produced with that in a similar experiment carried out with a bromide solution of known strength. By this means the presence of small quantities of bromine in the brain of animals poisoned with NaBr was demonstrated.—J. H. B.

2291. Über kolloidales Arsen. F. Külz (*Arch. exp. Path. Pharm.*, 1921, **89**, 111-43).—Colloidal arsenic has not the pharmacological action of the element arsenic. It acts only in so far as it becomes transformed in the body to As_2O_3. It brings about an increase of red cells, due to concentration of the blood, without the initial anæmia produced by arsenious acid. Colloidal arsenic leads to a degeneration of large numbers of polymorph leucocytes, and does not cause increased formation of red cells in the bone-marrow. It acts just as well as arsenious acid on protozoal infections (trypanosomiasis, etc.) in the mouse.—J. H. B.

2292. Action nocive de l'eau sur des stentors, en fonction de la masse de liquide. A. Drzewina and G. Bohn (*Compt. rend. soc. biol.*, 1921, **84**, 917-9).—When an attempt is made to find a lethal concentration of a toxic substance for various aquatic creatures, such as tadpoles, infusoria, planaria, hydra, etc., the number of animals in a given volume of solution is an important factor. A particular concentration, just lethal for a single animal, will be sublethal if several are present.—J. H. B.

2293. Variations dans le temps de la résistance aux agents physiques et chimiques, chez Rana fusca. A. Drzewina and G. Bohn (*Compt. rend. soc. biol.*, 1921, **84**, 963-5).—Specimens of *Rana fusca* at slightly different stages of development are affected to very different degrees by (1) immersion in KCN, (2) heat at 39° C., (3) colloidal silver.—J. H. B.

2294. Étude chimique et physiologique de la muscarine et de quelques uns de ses dérivés. V. Brabant (*Arch. internat. de pharm. et de therap.*, 1920, **25**, 295-320).—Homomuscarine is one-quarter as poisonous as anhydromuscarine. Triethylhomomuscarine is, however, equally poisonous with homomuscarine. The diastolic arrest produced by the triethly or trimethyl derivative is not abolished by atropine. Details of the methods of preparation of these substances are given.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2295. Die Bekämpfung der Cocainvergiftung im Tierversuch. A. Hofvendahl (*Biochem. Zeit.*, 1921, **117**, 55-66).—The effects of lethal doses of cocaine can be inhibited by sodium veronal, chloral hydrate, scopolamine, etc.—C. L. E.

2296. Intoxication chronique par la scopolamine. Alexander (*Le scalpel*, 1921, **74**, 352-3).—E. Z.

2297. Die Vergiftung durch Trinitrotuol. L. Lewin (*Arch. exp. Path. Pharm.*, 1921, **89**, 340-59).—An account of T.N.T. poisoning.—J. H. B.

2298. Recherches expérimentales sur le venin des abeilles. R. Lissy (*Arch. intern. de physiol.*, 1921, **16**, 272-87).—Injecté dans les veines du lapin, le venin des abeilles produit des accidents protéotoxiques: chute précoce de la pression artérielle parfois précédée d'une élévation fugitive, accélération respiratoire, augmentation très importante du péristaltisme intestinal, se manifestant par l'expulsion de nombreux bols fécaux, diminution de la coagulabilité du sang. Chez le chien, soit hypertension, soit hypotension suivie d'une hypertension—comme pour le venin des scorpions sahariens. (Le venin des abeilles est donc comme ceux des serpents un venin protéotoxique.)—L. F.

2299. Expérience de cours se rapportant à l'azotémie. L. Hugounenq and G. Florence (*Bull. de la soc chim biol.*, 1921, **3,** 174-5).—A method for demonstrating the poisonous effects of urea and NH_4 salts by subjecting fish to their influence. Fish live without apparent ill-effects in urea solutions up to 2% for days. The addition of Jackbean flour and acid sodium phosphate (4%) to water does not render it poisonous to fish, but this addition to a urea solution produces a poisonous fluid which kills the fish in a short time after convulsive seizures. This is due to liberation of ammonia by the urease of the bean.—E. P.

PATHOLOGY

2300. Studies of the Suspension Stability of the Blood in Pulmonary Tuberculosis. A. Westergren (*Acta med. scand.*, 1921, **4,** 247).—Blood is allowed to stand in a long, fine tube, and the height of the plasma layer is noted graphically as sedimentation in mm. per hour. This reaction is a more reliable index of tuberculous activity than temperature. It is not specific for tuberculosis, but may have a diagnostic value. The reduced suspension stability is due to increase in fibrinogen and/or globulin content.—J. A. H. (*Med. Sci.*).

2301. Kennen wir Erkrankungen des Menschen, die durch eine Störung des intermediär Purinstoffwechsels verursacht werden? S. J. Thannhauser and G. Czoniczer (*Deutsch. Arch. f. klin. Med.*, 1921, **135,** 224-39).—No disease of man is known up to the present which is caused by a disturbance of nuclein metabolism. Gout exists in 2 forms, primary constitutional gout and secondary gout. The first is caused by a functional debility of the kidneys in regard to the excretion of the uric acid. Secondary gout is the consequence of diffuse chronic nephritis.—H. W.

2302. Contribution à l'étude de l'histologie pathologique et de la pathogénie dans l'idiotie amaurotique—I. G. Marinesco (*Compt. rend. soc. biol.*, 1921, **84,** 1021-4).—Histological examination of the C.N.S. in a case of amaurotic idiocy. The changes are the expression of abnormal intracellular enzymes. There is hydrolysis of proteins by a protease, producing a swelling of the cells. Further, the derangements in this disease are in immediate relation to irregularities in the diastatic activity of the cytoplasm. The familial character of the disease is suggested to depend on the diastatic activity of the mitochondria, for the nucleus is intact until a late stage.—J. H. B.

2303. Mechanism of Autolysis in Paroxysmal Hæmoglobinuria. W. Yorke and J. W. S. Macfie (*Brit. J. Exp. Pathol.*, 1921, **2,** 115-30).—When the blood of a case of paroxysmal hæmoglobinuria was cooled at 0° C. for 5 min. only, before warming at 37° C. for 1 hr., the amount of hæmolysis which resulted was about 10 times as great as that which occurred when the cooling was prolonged for 30 min. The explanation is as follows: In hæmoglobinuric serum immune body is greatly in excess of complement, and sensitised red cells take up the mid-piece of the complement at 0° C., whereas the persensitised erythrocytes can only absorb end-piece at higher temperatures. Many more erythrocytes are sensitised after cooling for 30 min. than for 5 min.; consequently, mid-piece is diffused amongst a correspondingly greater number of cells. On warming the concentration of end-piece available for each persensitised erythrocyte depends directly on the number of these, and when the number is very great (*e.g.*, after cooling 30 min.) the concentration is insufficient to produce lysis. The immune body erythrocyte reaction is reversible, but ceases to be so as soon as the erythrocytes have become persensitised. Experiments for determining whether the immune body is thermostable or thermolabile were inconclusive.—W. D. H.

2304. La dilatation aiguë du poumon du cobaye dans le choc anaphylactique. H. de

Wacle (*Arch. intern. de physiol.*, 1921, **16**, 251-71).—Le choc anaphylactique se traduit chez le cobaye par une dilatation aiguë du poumon, phénomène spécial à cet animal. L'auteur admet que le choc anaphylactique, en accélérant et en affaiblissant le travail cardiaque, conduit à la dyspnée, c'est à dire à l'excitation du centre respiratoire: chez les animaux où l'influx expiratoire est le plus fort (chien, chat), la respiration est affaiblie mais reste équilibrée; chez le lapin les deux influx sont presque équivalents; mais chez le cobaye, l'expiration insuffisante est encore aggravée et entravée par une congestion pulmonaire avec augmentation de la pression veineuse, et ainsi s'installe la crise d'asthme et la dilatation pulmonaire.—L. F.

2305. Anaphylaxie et chimiotaxie. S. Metalnikow (*Compt. rend. soc. biol.*, 1921, **84**, 932-4).—If capillary tubes containing the sensitising protein be placed in the tissues of an anaphylactic guinea-pig, the tubes are found quickly smothered in leucocytes. A desensitised guinea-pig does not behave in this way, nor does an anaphylactic guinea-pig which is first anæsthetised. The author concludes that anaphylactic shock is due to occlusion of capillaries by leucocytes.—J. H. B.

2306. Pouvoir agglutinant microbien du sérum sanguin et choc anaphylactique. F. Arloing, L. Thévenot, and L. Langeron (*Compt. rend. soc. biol.*, 1921, **84**, 977-8).—As a rule, the production of anaphylactic shock does not affect the agglutinating power of an animal's serum.—J. H. B.

2307. Anaphylaxie alimentaire et sa thérapeutique. W. Kopaczewski (*Compt. rend.*, 1921, **172**, 1386-8).—Instances are given of anaphylaxis occurring in human subjects. In two cases the exciting cause was injection of antidiphtheritic serum, and the patients had been fed on horse-flesh. In other cases the exciting cause was the injection of a preparation of sheep's blood, and the patients had lived largely on mutton. Where there is reason to fear such a result, preventive measures are recommended, such as a previous injection of camphorated oil or of alkaline carbonate.—J. A. M.

2308. L'autolyse transmissible du staphylocoque et l'action coagulante des cultures lysées. A. Gratia (*C. r. de la soc. belge de biol.*, 1921, 25-6).—Ainsi que les travaux de Twort l'avaient déjà indiqués en 1915, la pulpe vaccinale de veau contient un principe lytique capable de provoquer l'autolyse transmissible du staphylocoque. Les filtrats stériles des cultures lysées de staphylocoque possèdent, tout tout comme le microbe lui même, la propriété de coaguler le plasma oxalaté et le plasma hirudiné. —E. Z.

2309. Recherches sur la teneur en chlorures du plasma au cours de divers états pathologiques. A. T. B. Jacobsen and M. Palsberg (*Compt. rend. soc. biol.*, 1921, **84**, 1041-3).—In nephritis, amyloid disease, cardiac lesions, and various other inflammatory conditions, there was no important variation in plasma chloride.—J. H. B.

2310. Recherches sur la spirochétose spontanée du lapin. C. Levaditi, A Marie, and Isaïca (*Compt. rend. soc. biol.*, 1921, **85**, 51-4).—A spirochætal infection exists in rabbits due to *S. cuniculi*, an organism morphologically indistinguishable from *S. pallida*. It is not pathogenic to the human subject.—J. H. B.

2311. Un Schizotrypanum chez les Chauves-Souris (Vesperugo pipistrellus) en Basse-Alsace. Schizotrypanose et goitre endémique. E. Chatton and R. Courrier (*Compt. rend. soc. biol.*, 1921, **84**, 943-6).—The authors describe a trypanosome found in cysts in the intestinal mucous membrane of bats in Basse-Elsace. It also occurs in the blood. They suggest it is a possible cause of endemic goitre.—J. H. B.

2312. Recherches histologiques et histochimiques sur l'atrophie pigmentaire du foie. F. Ladreyt (*Compt. rend.*, 1921, **172**, 1247-9).—The liver referred to was obtained from a specimen of *Scyllium catulus*, and was two-thirds of normal size. It showed patches of necrosis, and contained pigmented cells, some yellow, some black. The yellow pigment was hæmosiderin, the black hæmofuscin.—J. A. M.

PLANT PHYSIOLOGY

GENERAL

2313. Sull' influenza di alcune sostanze organich esullo sviluppo delle plante—V. G. Ciamician and C. Ravenna (*Atti R. Accad. Lincei, Rendiconti, Classe sci. fis., mat. e nat.*, 1921, [5], **30,** [i.], 3-7).—For I., II., III., IV. see these abstracts, Vol. II., p. 297; III., p. 291; IV., p. 192; V., p. 433, where title should be as above. Butylamine brings about albinism in leaves, though to a less extent than isoamylamine. The poisonous character of a number of amines and other substances is investigated. Bases with condensed nuclei are more toxic than those with simpler nuclei. Further investigation with spinach leaf-pulp and with bean and maize plants on the oxidation of catechol, guaiacol, morphine, and codeine and other substances show that substances more injurious to plants can better withstand oxidation by plant enzymes. The function of alkaloids in plants in the light of the authors' results is discussed. Tannin exerts no toxic influence on the plants examined. Only those plants containing a particular poison are immune to its toxic action.—W. S.

2314. Fruit Cool Storage. Apples and Pears. G. Esam (*New Zealand J. Agric.*, 1920, **20,** 10-8).—The chief aims of the experiments were to ascertain the best time to pick the fruit for cold storage and to test the effect upon the fruit of delay from a few days up to 2 weeks between the date of picking and the date the fruit is placed in the cold store.—C. W.

2315. An Anatomical Study of Cycloloma atriplicifolium. D. J. Pratt (*Univ. of Kansas Science Bull.*, 1917, **10,** 87-120).—Records nature of the cell contents in various parts of the plant.—C. W.

2316. Histology of Astragalus mollissimus. N. Ritter (*Univ. of Kansas Science Bull.*, 1917, **10,** 197-208).—Describes the cell contents of the "loco" weed, *Astragalus mollissimus*.—C. W.

2317. The Physiological Anatomy of the Plants of the Indian Desert. T. S. Sabnis (*J. Indian Bot.*, 1921, **2,** 1-19).—Deals with Compositæ, Salvadoraceæ, Asclepidaceæ, and Gentianaceæ.—C. W.

2318. The Physiological Anatomy of the Plants of the Indian Desert. T. S. Sabnis (*J. Indian Bot.*, 1921, **2,** 61-79).—Deals with Boraginaceæ, Solanaceæ, and Convolvulaceæ.—C. W.

2319. The Lichen as Transmigrant. A. H. Church (*J. of Bot.*, 1921, **59,** 7-13, 13-46).—Theoretical.—C. W.

CHEMICAL

2320. The Sugar of the Fruit of Phytolacca dioica, Linn. V. Arreguine (*Anal. Soc. Quim. Argentina*, 1920, **8,** 229-32).—The fruit of *Phytolacca dioica*, Linn. (Ombù), has been shown to contain 11·2% of non-reducing sugar (Balland). The author has isolated this sugar in a crystalline state. It appears to be sucrose.—W. S. (*J. C. Soc.*).

2321. The Anthocyanins of Beta vulgaris, L., and Raphanus sativus, L. Gustav Schudel (*Diss., Zurich*, 1918, 1-64).—For the separation of diglucosides, monoglucosides, and anthocyanidins in the same solution, a table of solubilities is given, and a method for the detection and estimation of these substances is described. From red beets the colouring matter *betanin* is separated as a bronze-green, lustrous glucoside containing 55·16% C, 4·96% H, and 8·57% N. Elimination of sugar yields *betanidin;* on account of its instability this substance was obtained only as *ethylbetanidin*, a violet-red substance containing 60·24% C, 5·27% H, and nitrogen. From the peelings of yellowish-red radishes, *raphanin hydrochloride* is obtained as a lustrous vermilion powder con-

taining 52·49% C, 5·28% H, and 5·63% Cl. Raphanin is a diglucoside. The corresponding anthocyanidin, *raphanidin*, is identical with pelargonidin. Violet radishes yielded the pigment *rubin*, a dark carmine-red diglucoside. *Rubidin* is identical with cyanidin. The properties of the pigments are described.—W. S. (*J. C. Soc.*).

2322. Cellulose—III. K. Hess and E. Messner (*Ber. deut. chem. Ges.*, 1921, **54** [B], 834-41).—Chemical.—W. S.

2323. Cellulose. K. Freundenberg (*Ber. deut. chem. Ges.*, 1921, **54** [B], 767-72).—Chemical.—W. S.

2324. Experiments on Wood Cellulose. Watson G. Harding (*J. Physical Chem.*, 1921, **25**, 201-3).—If wood cellulose is heated at about 100° with dilute sodium hydroxide for a sufficient time, the rate of attack may become as low as zero.—W. S. (*J. C. Soc.*).

2325. Plant Colloids—VIII. M Samec and J. Matula (*Koll. Chem. Beihefte*, 1919, **11**, 37-73).—Investigation of the degradation of cellulose sulphite by 85 to 50 % sulphuric acid and 85 to 76·5% phosphoric acid.—W. S. (*J. C. Soc.*).

2326. Plant Colloids—X. M. Samec and Anka Meyer (*Koll. Chem. Beihefte*, 1920, **13**, 165-92).—The action of formaldehyde solutions of various concentrations on potato starch at various temperatures was investigated.—W. S. (*J. C. Soc.*).

2327. Nature of the Process of Swelling—I. E. Knoevenagel and Otto Eberstadt (*Koll. Chem. Beihefte*, 1921, **13**, 194-212).—A large number of experiments on the swelling of acetyl cellulose are described.—W. S. (*J. C. Soc.*).

2328. The Hydrocyanic Acid Question. V. Treub's Hypothesis. L. Rosenthaler (*Schweiz. Apoth.-Zeit.*, 1920, **58**, 137-42).—Discussion of the part played by HCN in the process of N assimilation. The facts hitherto established are insufficient to prove or disprove the hypothesis that HCN is the first recognisable product of nitrogen assimilation, and it is probable that the rôle of this compound is not the same in all cases.—W. S. (*J. C. Soc.*).

2329. The Hydrocyanic Acid Question. VI. Hydrocyanic Acid Content of the Leaves of Cherry Laurel. L. Rosenthaler (*Schweiz. Apoth.-Zeit.*, 1921, **59**, 10-13, 22-26).—When the leaves are developing, the youngest leaves show the highest content of HCN. In the later stages of growth the distinction is not so marked. The distribution in individual leaves is uniform as a rule, except that, particularly in young leaves, the mid-rib is richer in HCN than the rest of the leaf.—W. S. (*J. C. Soc.*)

2330. Microchemical Examination of Certain Orchids for Alkaloids and Tannin. D. H. Wester (*Ber. deut. pharm. Ges.*, 1921, **31**, 179-83).—Various organs of 33 orchidaceous plants were examined. Neither tannin nor HCN was detected in any case, and only in 3 instances were alkaloids found.—W. S. (*J. C. Soc.*).

2331. The Active Constituents of Shepherd's Purse (Capsella bursa pastoris). H. Boruttau and H. Cappenberg (*Arch. Pharm.*, 1921, **259**, 33-52).—These are acetylcholine, and probably tyramine.—W. S. (*J. C. Soc.*).

2332. The Active Constituents of Capsella bursa pastoris. H. W. Van Urk (*Pharm. Weekblad.*, 1921, **58**, 553-6).—The effects cannot be ascribed to alkaloids. The presence of a glucoside is doubtful, and the absence of allylthiocarbimide is confirmed.—W. S. (*J. C. Soc.*).

2333. Lichen Products. III. Determination of the Constitution of Divarinol. Adolf Sonn (*Ber. deut. chem. Ges.*, 1921, **54**, [B], 773-4).—Hesse has isolated divarinol, m.-p. 82° to 83°, from various species of *Evernea*, and has considered it to be 3:5-dihydroxyl-1-*n*-propylbenzene. Since 2 : 4-dihydroxy-1-*n*-propylbenzene (Johnson and A. Hodge, 1913) has the same melting-point, it appeared possible that the two substances might in reality be identical. Repetition of the latter work, however, has shown that anhydrous 2 : 4-dihydroxyl-1-*n*-propylbenzene has m.-p. 107° to 108°, b.-p. 172° to 174°/14 to 15 mm., whilst the hydrated form has m.-p. 71°; the product obtained by Johnson

and Hodge appears to have been incompletely freed from water of crystallisation, which is very obstinately retained.—W. S. (*J. C. Soc.*).

2334. On the Occurrence of Raffinose in the Seed of Nelumbo nucifera, Gaerln. F. Hemmi (*J. Coll. Agric. Hokkaido Imp. Univ. Sapporo, Japan*, 1921, **9**, 249-60).—It is concluded that the most important sugar in lotus seeds is raffinose, also that the presence of a little glucose and sucrose is highly probable.—C. W.

2335. Narcotic Plants and Stimulants of the Ancient Americans. W. E. Safford (*Smithsonian Rep. for* 1916, Washington, 1917, 387-424).—It is suggested that investigations be undertaken to determine the nature of the properties of certain little-known narcotics which can be obtained from many of the plants mentioned in the paper.—C. W.

2336. The Direct Determination of Sucrose in the Presence of Reducing Sugars. M. A. Schneller (*Louisiana Agric. Exp. Stat. Bull.*, **156**, 1916, 1-12).—Records results of experiments which show that three sources of error are inherent in the direct methods of sucrose determination in the presence of reducing sugar.—C. W.

2337. The Determination of Carbon Dioxide in Water-Insoluble Carbonates. C. S. Robinson (*Soil Sci.*, 1920, **10**, 41-7).—Describes a titrimetric method and a gasometric method for determining CO_2 in water-insoluble carbonates. These methods are suitable for use with such materials as limestones, marls, and soils.—C. W.

2338. The Determination of Nitrites and Nitrates in Plant Tissue. W. H. Strowd (*Soil Sci.*, 1920, **10**, 333-42).—A procedure is suggested which gives satisfactory results for the determination of nitrites and nitrates in plant extract.—C. W.

2339. The Antagonistic Action of Calcium and Iron Salts toward other Salts as measured by Ammonification and Nitrification. J. E. Greaves (*Soil Sci.*, 1920, **10**, 77-102).—A true antagonism exists between calcium sulphate and sodium carbonate, sodium nitrate, sodium sulphate, calcium chloride, magnesium chloride, and magnesium sulphate, as measured in terms of ammonification. A similar antagonism exists between these salts, with the exception of calcium sulphate and calcium chloride and calcium sulphate, as measured in terms of nitrification.—C. W.

2340. The Influence of Initial Reaction on the Oxidation of Sulphur and the Formation of Available Phosphates. J. G. Lipman and J. S. Joffe (*Soil Sci.*, 1920, **10**, 327-32).—From the results of the experiments recorded it appears that there is no advantage in starting with a relatively high hydrogen-ion concentration through additions of sulphuric acid.—C. W.

2341. The Hydrogen-Ion Concentration of Certain Three-Salt Nutrient Solutions for Plants. A. G. McCall and J. R. Haag (*Soil Sci.*, 1920, **10**, 481-5).—In general, within any one type, the H-ion concentration of the solution is a function of the volume-molecular proportion of the dihydrogen phosphate salt present. The variations in plant growth, within any one type of solution, cannot be correlated with differences in the H-ion concentration of the solutions.—C. W.

2342. Tannin Content of Some Hokkaido Materials. L. Balderston (*J. Coll. Agric. Hokkaido Imp. Univ. Sapporo, Japan*, 1921, **10**, 29-35).—Gives analyses of several Hokkaido plants with respect to tannin contents.—C. W.

2343. Bemerkungen über die Natur des Hefefetts. I. S. MacLean (*Zeit. physiol. Chem.*, 1921, **114**, 199-200).—Reply to criticisms of Hinsberg and Roos.—H. W. D.

2344. Über die Hefenucleinsäure. II. Mitt. H. Steudel and E. Peiser (*Zeit. physiol. Chem.*, 1921, **114**, 201-3).—A commercial preparation of yeast nucleic acid was found to contain 12 to 14% of free guanylic acid.—H. W. D.

2345. Die Stickstoffhaltigen Bestandteile der Hefe. II. Die Purinbasen und Diaminosäuren. J. Meisenheimer (*Zeit. physiol. Chem.*, 1921, **114**, 205-49).—No appreciable difference in composition was found between top and bottom yeasts. The distribution

total nitrogen % is as follows: 8 ammonia; 4 guanine; 4 adenine; 2·4 cytosine (?); 3 uracil (?); 10 histidine-arginine; 10 lysine; 0·5 glycine; 10 to 15 alamine; 10 to 15 valine; to 10 leucine; 2 proline; 8 phenylalanine; 3·5 aspartic acid; 6 glutaminic acid; 2 tyrosine; 5 tryptophane; 2 cystine and other sulphur-containing compounds; 4·5 oxyproline (?); 5 choline; 0·5 glucosamine.—H. W. D.

ENZYME ACTION

2346. The Salt Effect in Alcoholic Fermentation. A. Harden and F. R. Henley (*Biochem. J.*, 1921, **15,** 312-8).—Na and K chlorides and sulphates have a depressing effect on the maximum rate and the rate of attainment of the maximum fermentation of glucose and fructose by yeast juice or zymin in presence of phosphate. The influence of sulphate is greater than that of chloride. Salts do not influence the rate of action of carboxylase, but reduce that of hexosephosphatase. The depressing effect of K phosphate is not influenced by addition of acetaldehyde, as is the depressing effect of excess of phosphate.—W. S.

2347. Oxydases. The Bach-Chodat System. O. Fernandez (*Ann. Fis. Quim.*, 1921, **19,** 109-14).—Discussion of the action of peroxydases in plants. Juices of some plants which contain an incomplete peroxydase system can produce the blue colour with guaiacum in presence of oxybrucine or oxystrychnine.—W. S. (*J. C. Soc.*).

2348. Über die Regeneration inaktivierter Saccharase durch Dialyse. H. v. Euler and O. Svanberg (*Zeit. physiol. Chem.*, 1921, **114,** 137-48).—Saccharase solutions are inactivated by treatment with silver nitrate, mercuric chloride, or aniline. By dialysis the activity can be restored partially in the first and second cases, and completely in the third.—H. W. D.

2349. Über Hefegummi und Saccharase. E. Salkowski (*Zeit. physiol. Chem.*, 1921, **114,** 307-8).—A criticism of Svanberg's recently published views on the chemical relationship between yeast gum and saccharase. The author points out that he has already published experiments in which he prepared active saccharase solutions which contained no gum.—H. W. D.

2350. Microchemistry of Micro-organisms. I. Biochemistry of Bacillus mesentericus vulgatus. W. Grimmer and B. Wiemann (*Forsch. Geb. Milchwirt.*, 1921, **1,** 118).—*Bacillus mesentericus vulgatus* contains a proteolytic enzyme which in a very weak acid medium hydrolyses casein to its simplest constituents: alanine, valine, leucine, prosine, aspartic acid, glutamic acid, proline, arginine, lysine, histidine, tryptophan, and perhaps phenylalanine. In the presence of lactose, proteolysis is not so complete; putrescine, cadaverine, tryptamine, tyrosol, and ammonia were identified.—W. S. (*J. C. Soc.*).

2351. Enzyme Formation by Penicillium glaucum. H. von Euler (*Fermentforsch.*, 1920-21, **4,** 242-57).—Experiments were made on the inversion of different sugar solutions by *Penicillium glaucum*. The conditions of the experiments as to percentage of sugar, age, and state of fructification of the fungus, and temperature were varied. The saccharase content of the fungus as evidenced by the inversion produced was calculated from the formula: Inversion capacity = inversion constant × weight of sugar/weight of dry substance of fungus. The inversion capacity was highest on the fourth day of growth, and at a temperature under 16°. The conidia of the fungus had only a third of the inversion capacity of the mycelium. The highest inversion capacity was exhibited in solutions of cane sugar and galactose. *P. glaucum* contains but a fifth of the saccharase content of bottom yeast and a sixth of that of top yeast.—W. S. (*J. C. Soc.*).

VEGETATIVE DEVELOPMENT

2352. The Relation between the Calcium and the Nitrogen Content of Plants and the Function of Calcium. F. W. Parker and E. Truog (*Soil Sci.*, 1920, **10,** 49-55).—Whereas there is a rather close relation between the calcium and nitrogen content of plants, the contents of potassium, phosphorus, and magnesium do not bear this close relation to the nitrogen content.—C. W.

2353. Cross-Inoculation Studies with the Nodule Bacteria of Lima Beans, Navy Beans, Cow-peas, and Others of the Cow-pea Group. A. L. Whiting and R. Hansen (*Soil Sci.*, 1920, **10,** 291-300).—The nodule bacteria of the lima bean (*Phaseolus lanatus*) are distinct from those of the navy and kidney beans (*Phaseolus vulgaris*) for inoculation purposes. The nodule bacteria of lima beans are identical with those of the cow-pea group for inoculation purposes.—C. W.

2354. The Effect of Fertilisers on Blueberries. C. S. Beckwith (*Soil Sci.*, 1920, **10,** 309-13).—Experimental.—C. W.

2355. The Relation of Nitrates to Nodule Production. W. H. Strowd (*Soil Sci.*, 1920, **10,** 343-56).—Nitrates retard, and in sufficient quantities entirely prevent, nodule formation.—C. W.

2356. Nutrient Requirement of the Potato Plant Grown in Sand Cultures treated with "Type I" Solutions. E. S. Johnston (*Soil Sci.*, 1920, **10,** 389-409).—Whether the green weight of plants (tops and roots together) or the green weight of new tubers produced is used as the criterion of growth, the best average values of corresponding cultures of the two series of experiments conducted occurred for the cultures high in calcium nitrate and low in magnesium sulphate with a medium amount of potassium phosphate.—C. W.

2357. The Variability of Plants Grown in Water Cultures. A. R. Davis (*Soil Sci.*, 1921, **11,** 1-32).—There appears to be no one "best" solution—at least, under the conditions of control which can be maintained at present. No difference was apparent between the dry weights of the complete plant and tops alone as criteria of comparison.—C. W.

2358. The Influence of Iron in the Forms of Ferric Phosphate and Ferrous Sulphate upon the Growth of Wheat in a Nutrient Solution. L. H. Jones and J. W. Shrive (*Soil Sci.*, 1921, **11,** 93-9).—Preliminary results are recorded.—C. W.

2359. Variety Trials with Oats. Report No. 1 (*Welsh Plant Breeding Station, Univ. Coll. Wales, Aberystwyth*, Ser. C, 1920, 5-40).—Gives tables to show the relationship between the number of days taken for several varieties of oats to ripen, with the rapidity of growth during the earlier stages, and with the time of maximum panicle exsertion. The influence of date of sowing on length of period taken to ripen is also shown.—C. W.

GROWTH OF LOWER PLANTS

2360. The Heat liberated by Bacillus coli when Grown in the Presence of Free Amino-acids. C. Shearer (*J. Physiol.*, 1921, **55,** 50-60).—When *B. coli* is supplied with abundant free amino-acids, the process of building these into living protoplasm is an extremely economical one as compared with the growth on glucose-peptone broth. Tryptic broth which has been digested a short time (1 week) produces considerably more heat with *B. coli* than the same broth digested for a long time (3 to 8 weeks). The pathological process of metabolism—as in absence of O_2 or in presence of a cytolysing agent—either with tryptic digest or any other culture fluid, is always accompanied by a greater liberation of heat than is given by the same amount of growth on the same

medium under normal healthy conditions, so that pathological is less economical than normal growth.—J. A. C.

2361. Growth Accessory Substances in the Nutrition of Bacteria. T. Thjotta and O. T. Avery (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 197-9).—Extracts of yeast, fresh tomatoes, green peas, and string beans, stimulate the growth of *Bacillus influenzæ*. This is supposed to be due to growth accessory substances analogous to vitamins. Cultivation of the bacteria cannot, however, be continued for more than 1 or 2 transfers in yeast broth alone; some other factor is needed, possibly carried over from the original blood culture. The vitamin-like factor is destroyed by heating in the autoclave, the other factor is not. Both factors occur in blood which is always used in the cultivation of *B. influenzæ*.—D. H. de S.

2362. The Deterioration of Cane Sugar by Fungi. N. Kopeloff and L. Kopeloff (*Louisiana Agric. Exp. Stat. Bull.* **166,** 1919, 1-72).—Sterilised sugars inoculated with pure cultures of fungi deteriorated rapidly where the moisture content was appreciable, whereas little deterioration occurred when the moisture content was reduced to a minimum.—C. W.

2363. Effect of Fungi on the Germination of Sugar Cane. C. W. Edgerton and C. C. Moreland (*Louisiana Agric. Exp. Stat. Bull.* **169,** 1920, 1-40).—Discusses the relations of temperature to the organisms which occur on reed cane.—C. W.

2364. The Influence of Reaction on Colour Changes in Tryptophan Solutions. Elfrida C. V. Mattick and R. S. Williams (*Biochem. J.*, 1921, **15,** 213-5).—The colour was produced in tryptophan solutions inoculated with *B. proteus vulgaris*. The organisms did not grow nor produce colour when inoculated into tryptophan alone, or in solutions with acidities from P_H 1·8 to 2·5. In solutions with alkaline reaction growth took place and colour was produced with H-ion concentration from P_H 8·95 to 9·44. Growth took place, but no colour was produced, in solutions with P_H 9·51 to 9·60. The colour produced showed a definite sequence from deep orange to light yellow with increasing alkalinity.—W. S.

ASSIMILATION

2365. Nitrogen Fixation by Cow-peas and Nodule Bacteria. A. L. Whiting and W. R. Schoonover (*Soil Sci.*, 1920, **10,** 411-20).—The progress of nitrogen fixation is related to the development of the plant, the more rapidly the plant grows the greater being the rate of increase in nitrogen fixed. Preliminary studies of the mechanism of nitrogen fixation did not indicate that oxidation or reduction was concerned in the process.—C. W.

2366. The Forms of Nitrogen in Soy-bean Nodules. W. H. Strowd (*Soil Sci.*, 1921, **11,** 123-30).—The first product of N assimilation by legume bacteria and the form or forms of N assimilated by the plant from the nodule are unknown.—C. W.

WATER RELATIONS

2367. The Osmotic Concentration and Electrical Conductivity of the Tissue Fluids of Ligneous and Herbaceous Plants. J. A. Harris, R. A. Gortner, and J. V. Lawrence (*J. Physical Chem.*, 1921, **25,** 122-46).—Studies in the Arizona deserts, in the Jamaican montane rain forest, and in the mesophytic habitats of the north shore of Long Island, have shown that the osmotic concentration as measured by the cryoscopic method is far higher in the leaf-tissue fluids of ligneous than of herbaceous species, whilst for non-halophytic habitats of the north shore of Long Island the electrical conductivity was lower for the expressed juice of leaf tissues of ligneous species than for that of herbaceous forms. The concentration of ionised solutes is lower in ligneous than in herbaceous forms, whilst the reverse is true of total solutes.—W. S. (*J. C. Soc.*).

2368. Effect of Salt Solutions having Definite Osmotic Concentration Values upon Absorption by Seeds. W. Rudolfs (*Soil Sci.*, 1911, **11,** 277-93).—The rates of absorption are progressively retarded with an increase in the osmotic concentration values of the solutions which do not react with the seed substance to modify in a chemical way the imbibing properties of the seeds. Average absorption rates show an approximately linear relation to the osmotic concentration values of the solutions, decreasing with an increase in concentration, except in dilute solutions. Experimental evidence points to the conclusion that retardation of the absorption rates is accomplished through osmotic resistance offered to water entrance into the seed.—C. W.

FLOWER AND FRUIT FORMATION

2369. The Pollination of the Pomaceous Fruits. III. Gross Vascular Anatomy of the Apple. E. G. Kraus and G. S. Ralston (*Oregon Agric. Coll. Exp. Stat., Div. of Horticulture, Bull.* **138,** 1916, 1-11).—The author has traced the vascular system of the normal fruit from its origin in the cluster-base. It is suggested that the vascular anatomy of the fruit is one of the subsidiary factors concerned with pollination and general development.—C. W.

2370. Delayed Ripening of Tomatoes caused by Spraying with Bordeaux Mixture. C. W. Edgerton (*Louisiana Agric. Exp. Stat. Bull.* **164,** 1918, 1-16).—Spraying with Bordeaux mixture causes a delay in the ripening of tomatoes, this delay being from 1 to 2 weeks in the case of plants that are kept thoroughly sprayed throughout the season. The delayed ripening appears to be due to the greater vegetative growth of the sprayed plants. The diseases on the unsprayed plants have somewhat the same effect as pruning the plants—each results in hastening maturity.—C. W.

2371. Tests with Unfruitful Plum Trees. Anon. (*New Zealand J. Agric.*, 1920, **20,** 9).—The value of interpollination was confirmed.—C. W.

2372. Pollination of Fruits. C. H. Hooper (*J. Min. Agric.*, 1921, **28,** 124-33).—Experiments were carried out to determine (1) the effect of excluding insects, (2) whether the variety matured fruit with its own pollen, and (3) whether the variety set fruit better with pollen of a different variety.—C. W.

ENVIRONMENTAL FACTORS

2373. Climatic Cycles and Tree Growth. A. E. Douglass (*Carnegie Institute Pub.* **289,** Washington, 1919, 1-127).—In dry climates the thicknesses of the annual rings are proportional to the rainfall with an accuracy of 70% in recent years. An empirical formula can be made to express still more closely this relationship between tree growth and rainfall; the tree records therefore provide reliable indications of climatic cycles and of past climatic conditions. Double annual rings are caused by spring drought, and are indicative of the distribution of rainfall throughout the year.—C. W.

2374. The Influence of Snow on the Development of Vegetation in Spring. K. Davis (*Monthly Weather Rev., U.S. Dept. Agric.*, 1920, **48,** 222).—Abstract of an article by P. Jacques in *La Nature*, April 17, 1920. Jacques showed that from two standpoints a snow cover is valuable (1) as a thermal blanket protecting soil and vegetation against freezing, and (2) for the supply of nitrogen compounds which is furnished to soil and plants by the melting snow.—C. W.

2375. Mathematical Enquiry into the Effect of Weather on Corn Yield in the Eight Corn Belt States. H. A. Wallace (*Monthly Weather Rev., U.S. Dept. Agric.*, 1920, **48,** 439-46).—The object of this paper is to examine the relation between corn yield, rainfall, and temperature in the months of May, June, July, and August in each of the eight corn belt States. For the most part the method of investigation is by means

of correlation coefficients, multiple coefficients of correlation, and lines of regression. —C. W.

2376. Damage to Crops by Weather. J. Warren Smith (*Monthly Weather Rev., U.S. Dept. Agric.*, 1920, **48,** 446).—In the United States it appears that deficient moisture is the greatest single damaging factor in connection with every crop, except apples. Low temperature causes nearly three times as much damage to apples as dry weather.—C. W.

2377. Standing Wheat Fired by Lightning. E. L. Wells (*Monthly Weather Rev., U.S. Dept. Agric.*, 1920, **48,** 452).—C. W.

2378. Lightning and Forest Fires. A. H. Palmer (*Monthly Weather Rev., U.S. Dept. Agric.*, 1920, **48,** 452-3).—Mentions numerous cases of forest fires in the United States caused by lightning.—C. W.

2379. Lightning Injury in a Potato Field. E. S. Johnston (*Monthly Weather Rev., U.S. Dept. Agric.*, 1920, **48,** 452).—Describes an area in an experimental potato plot which had been struck by lightning.—C. W.

2380. The Plant Ecology of the Coast Belt of Natal. J. W. Bews (*Ann. Natal Museum*, 1920, **4,** 367-469).—A general account of the climatic conditions, soil conditions, and plant communities of the coast belt of Natal.—C. W.

2381. Drought-resisting Plants in the Deccan. R. K. Bhide (*J. Indian Bot.*, 1921, **2,** 27-43).—Gives a list of the principal plants found growing under the conditions of extreme drought which obtained in the Bombay Deccan in 1918-19. Moisture determinations of the soil surrounding the plants were made.—C. W.

2382. An Ecological Study of Deccan Grassland. W. Burns and G. M. Chakradev (*J. Indian Bot.*, 1921, **2,** 84-91).—The behaviour of the vegetation of a small piece of bad land in the Deccan has been followed for one rainy season.—C. W.

2383. Nitrogen in the Rain-water at Ithaca, New York. B. D. Wilson (*Soil Sci.*, 1921, **11,** 101-10).—The ammoniacal N was found to fluctuate from month to month and from year to year, while the nitrate nitrogen remained more constant. The amount of total nitrogen in the rain-water was to a large extent dependent upon the amount of rainfall, a high nitrogen content accompanying a correspondingly high precipitation.—C. W.

THE SOIL

2384. A Proposed Method for the Estimation of Total Calcium in Soils and the Significance of this Element in Soil Fertility. O. M. Shedd (*Soil Sci.*, 1920, **10,** 1-14).—The proposed method eliminates the chief sources of error of the regular procedure, gives more concordant results, and is more rapid. It has been found that the best types of soil contained the highest content of Ca, and the poorest had the lowest calcium content.—C. W.

2385. The Oxidising Power of Soil from Limed and Unlimed Plots, and its Relation to Other Factors. J. R. Neller (*Soil Sci.*, 1920, **10,** 29-39).—The oxidising power of the soil from the limed plots was approximately 40% greater than that from the unlimed plots. Nitrate accumulation and bacterial numbers were higher on the limed soil, whereas the ammonia accumulation was about the same for all of the plots.—C. W.

2386. The Relation of the Phosphoric Acid of the Soil to Pot Experiments. G. S. Fraps (*Texas Agric. Exp. Stat. Bull.* **267,** 1920, 1-53).—Discusses the relation between the chemical composition of the soil and the results of pot experiments with 95 samples of soil.—C. W.

2387. The Effect of Dicalcium Silicate on an Acid Marl. B. L. Hartwell and F. R. Pember (*Soil Sci.*, 1920, **10,** 57-60).—Dicalcium silicate was as effective as limestone in counteracting the toxic conditions existing in the acid soil, but there was no evidence

that there is any justification in claiming an additional value because of its content of silicon.—C. W.

2388. A Capillary Transmission Constant and Methods of Determining it Experimentally. W. Gardner (*Soil Sci.*, 1920, **10,** 103-26).—A capillary transmission constant is defined on theoretical grounds, and methods are described for the measurement of this constant in the laboratory. An illustrative calculation has been made indicating that approximately 12 ins. of water may be available from a 12-ft. water-table in a period of 30 days.—C. W.

2389. Organic Phosphorus Content of Ohio Soils. C. J. Schollenberger (*Soil Sci.*, 1920, **10,** 127-43).—Experimental.—C. W.

2390. The Effect of the Initial Moisture in a Soil on Moisture Movement. P. E. Karraker (*Soil Sci.*, 1920, **10,** 143-52).—Experiments showed that small differences in initial moisture content of soils were, for the most part, of little significance with regard to moisture movement.—C. W.

2391. Aluminium as a Factor in Soil Acidity. J. J. Mirasol (*Soil Sci.*, 1920, **10,** 153-217).—Records the results of experiments carried out to determine the influence of aluminium salts and aluminium hydroxide on the growth of sweet clover grown in sand; the effect of limestone and acid phosphate alone and in combination on the productivity and acidity of three types of silt loam soil; the effect of the removal of some Al from the soil on the growth of sweet clover; and whether Fe and Mn also are factors in the acidity of the soils investigated by the author.—C. W.

2392. The Formation of Soluble Substances in Soils taken from Widely Separated Regions. M. M. McCool and C. E. Millar (*Soil Sci.*, 1920, **10,** 219-35).—From the results obtained by the authors it cannot be said that soils formed under conditions of low precipitation are more soluble than are those that have proceeded somewhat farther in their weathering. Samples of soil taken from formations that have undergone extreme weathering are very inert.—C. W.

2393. The Effect of Certain Environmental Conditions on the Rate of Destruction of Vanillin by a Soil Bacterium. W. J. Robbins and A. B. Massey (*Soil Sci.*, 1920, **10,** 237-46).—It is believed that the number of species of soil bacteria able to destroy vanillin is limited. Slight concentrations of HCl inhibit the action on vanillin of the soil bacterium studied. Aeration favours the destruction of vanillin by the organism used.—C. W.

2394. Nitrogen Economy in the Soil as Influenced by Various Crops Grown under Control Conditions. R. C. Wright (*Soil Sci.*, 1920, **10,** 249-89).—Cultivation or excessive aeration of a soil causes a loss of total N. Under certain crops there is an absolute loss of N in excess of that recovered in the crops, this loss varying with different crops and different soils. This loss occurs under certain legumes as well as non-legumes.—C. W.

2395. The Influence of Soil Reaction on the Growth of Alfalfa. J. S. Joffe (*Soil Sci.*, 1920, **10,** 301-7).—The germination of alfalfa seeds was practically the same with P_H values of the soil varying from 4·5 to 7·0, but was greatly reduced in cultures which yielded soil extracts having P_H values below 4·5. Yields of alfalfa tops showed a gradual increase with an increase in the P_H values of the soil extracts from 3·8 to 7·0. With increasing H-ion concentration of the soil extracts, nodule formation on the roots of the plants was correspondingly less abundant.—C. W.

2396. Co-operative Experiments for the Composting of Phosphate Rock and Sulphur. W. B. Ellett and W. G. Harris (*Soil Sci.*, 1920, **10,** 315-25).—The addition of S to a compost of soil and rock phosphate increases the availability of phosphoric acid, but not to the same extent as when manure is added to a compost of soil, rock phosphate, and S.—C. W.

2397. The Capillary Potential and its Relation to Soil Moisture Constants. W. Gardner (*Soil Sci.*, 1920, **10,** 357-9).—A consideration of the subject of soil moisture from the standpoint of the capillary potential gives a new interpretation of the various soil moisture constants.—C. W.

2398. Influence of Moisture on the Bacterial Activities of the Soil. J. E. Greaves and E. G. Carter (*Soil Sci.*, 1920, **10,** 361-87).—A study of the influence of water upon the bacterial activities of 22 soils.—C. W.

2399. A New Classification of the Soil Moisture. G. Bouyoucos (*Soil Sci.*, 1921, **11,** 33-47).—This new classification is based upon the principle of the freezing of water. It is found that a portion of the soil water freezes very readily near 0° C., another portion freezes only when a temperature of – 4° C. is reached, and a third portion does not freeze at all, even at the low temperature of – 78° C.—C. W.

2400. Sulphur and Sulphur Composts in Relation to Plant Nutrition. W. E. Tottingham and E. B. Hart (*Soil Sci.*, 1921, **11,** 49-73).—It appears probable that S functions as a fertiliser both by oxidation to the nutrient SO_3 and by producing, through oxidation, an acid condition favourable to the production of available P_2O_5. These processes occur in composts of S and rock phosphate.—C. W.

2401. Inoculated Sulphur as a Plant Food Solvent. J. G. Lipman, A. W. Blair, W. H. Martin, and C. S. Beckwith (*Soil Sci.*, 1921, **11,** 87-92).—Inoculated S seems to be more effective than uninoculated S for rendering inert mineral plant food accessible to growing crops.—C. W.

2402. A Short Test for Easily Soluble Phosphate in Soil. O. M. Shedd (*Soil Sci.*, 1921, **11,** 111-22).—Experimental.—C. W.

2403. The Concentration of the Soil Solution around the Soil Particles. G. J. Bouyoucos (*Soil Sci.*, 1921, **11,** 131-8).—Experimental evidence is presented which proves that the solution around the soil particles and in the very fine capillary spaces is less concentrated than the mass of the solution.—C. W.

2404. Chemical Effect of Salts on Soils. W. P. Kelley and A. B. Cummins (*Soil Sci.*, 1921, **11,** 139-59).—Chemically equivalent solutions of the chlorides, sulphates, and nitrates of a given base produced substantially equivalent chemical reactions in the soils studied. It is suggested that the continued addition of soluble salts in the open field where the products of the reactions are removed either by the growth of crops or by intermittent leaching must ultimately result in building up a chemical system different from that originally present.—C. W.

2405. Minnesota Glacial Soil Studies. I. A Comparison of Soils on the Late Wisconsin and Iowan Drifts. C. O. Rost and F. J. Alway (*Soil Sci.*, 1921, **11,** 161-205).—The scope of the paper is indicated by its title.—C. W.

2406. A Pitless Lysimeter Equipment. W. H. MacIntire and C. A. Mooers (*Soil Sci.*, 1921, **11,** 207-13).—A description and illustrations of a distinctive equipment.—C. W.

2407. The Movement of Soil Moisture. W. Gardner and J. A. Widtsoe (*Soil Sci.*, 1921, **11,** 215-32).—Two assumptions have been made in the development and integration of a general equation for the movement of moisture through an *ideal* soil—viz.: (1) The inherent moisture conductivity in such a soil is independent of the moisture content. (2) The capillary potential is a linear function of the reciprocal of the moisture content.—C. W.

2408. Rate of Formation of Soluble Substances in Several Organic Soils. M. M. McCool and L. C. Wheeting (*Soil Sci.*, 1921, **11,** 233-47).—By means of the freezing-point method (used by Bouyoucos and others), the study of the relative activities of 7 organic soils under different moisture and temperature conditions, and at different depths, was carried out.—C. W.

2409. The Amount of Unfree Water in Soils at Different Moisture Contents. G. Bouyoucos (*Soil Sci.*, 1921, **11**, 255-9).—Presents experimental results showing that the amount of water which soils are able to render unfree does not vary with the different moisture contents, but that it appears to remain constant.—C. W.

2410. Lime Requirement and Reaction of Lime Materials with Soil. C. J. Schollenberger (*Soil Sci.*, 1921, **11**, 261-76).—Presents data from an experiment in which various lime materials were mixed with soil in undrained pots, watered, and kept partly outside and partly under greenhouse conditions. The conclusions formed are based upon determinations of residual carbonate, lime requirement, and accumulated nitrates.—C. W.

2411. A Comparison of the Technique recommended by Various Authors for Quantitative Bacteriological Analysis of Soil. Z. N. Wyant (*Soil Sci.*, 1921, **11**, 295-303).—C. W.

2412. The Effect of Continuous Cropping upon the Major Soil Nutrients. G. R. Stewart (*Soil Sci.*, 1921, **11**, 321-3).—Intensive study, extending over 6 seasons, of the changes that occur in soil nutrients as the result of the growth of successive crops of cereals.—C. W.

2413. The Amount of Salt in Irrigation Water Injurious to Rice. F. C. Quereau (*Louisiana Agric. Exp. Stat. Bull.* **171**, 1920, 1-14).—As the result of a series of experiments the author recommends that not more than 35 grains of salt per gallon of water should be used in a flooding of from 4 to 8 inches if this amount of salt water is to remain on the rice-field until it evaporates, or is diluted with fresh water.—C. W.

PATHOLOGY

2414. The Longevity of Cut Flowers. E. Archer (*Proc. Roy. Soc. Victoria*, 1920, **32**, N.S., 246-51).—Abnormal withering of cut flowers may be attributed to (1) blocking of the vessels, or (2) self-poisoning. The author was unable to prove any case of premature withering due to the latter cause.—C. W.

2415. Michigan Plant Diseases. G. H. Coons (*Michigan Agric. Exp. Stat. Special Bull.* **85**, 1918, 1-49).—Includes a description of certain diseases of the potato.—C. W.

2416. The Endophytic Fungus of Lolium—I. L. McLennan (*Proc. Roy. Soc. Victoria*, 1920, N.S., **32**, 252-98).—On the formation of endosperm the endophytic fungus is absorbed as a source of food-supply to the developing embryo. The author concludes that the association of the endophyte with *L. temulentum* and *L. perenne* is a well-marked case of symbiosis, comparable in many respects with that met with in *Calluna vulgaris*. It is shown by experiment that the fungus of *L. perenne* is unable to fix N in the total absence of external supplies of combined N.—C. W.

2417. A Comparison of Inoculated and Uninoculated Sulphur for the Control of Potato Scab. W. H. Martin (*Soil Sci.*, 1921, **11**, 75-85).—The addition of S to soil usually leads to an increase in soil acidity, due largely to the oxidation of the S by certain micro-organisms.—C. W.

BOOK REVIEWS

Recherches sur la théorie ionique de l'excitation. Première partie. Théorie et lois des excitations liminaires des muscles, des nerfs et des terminaisons nerveuses dans les organes des sens. P. Lasareff. Pp. 155. Moscow: Société des éditions scientifiques, 1918.

Beginning with a statement of his belief that vital phenomena can be accounted for by known physical laws, the author proceeds to give a critical historical account of

the investigation of the laws of excitation from Newton to Loeb. He concludes that the researches of Nernst and Loeb have placed beyond doubt the important part played by ions in excitation.

The succeeding chapters deal with the excitation of muscle and nerve, and of the various sense organs in turn. The production of the electrotonic state is explained as being due to the mobility of the monovalent ions (Na, K) being greater than that of the bivalent ions—*e.g.*, Ca. Hence K-ions accumulate rapidly at the cathode, while Ca-ions lag behind at the anode; and K-ions increase, while Ca-ions diminish excitability. Chemical, mechanical, and thermal stimulation each leads in its own way to diffusion of salts and ionic excitation. In the case of the end organ of vision, the decomposition of the visual purple gives rise to the appearance of ions, in the author's belief, and these excite the nervous structures. For the acoustic organ a hypothetical substance is postulated, which is decomposed in a similar way to the visual purple, and so also for the senses of taste, smell, and touch. The laws of Pflüger and Talbot are subjected to an exhaustive mathematical analysis, and numerous more or less complex formulæ are given in connection with the quantitative relationship between the strength of stimulus and the degree of reaction or sensation produced. The author does not profess to have given an exhaustive proof of the theory, but only to have laid a foundation for further work.—J. A. M.

Dictionary of Botanical Equivalents. By E. Artschwager and Edwina M. Smiley. Pp. 137. Baltimore: Williams and Wilkins Co., 1921.

This little book consists of a French-English and German-English dictionary of botanical terms which are not practically identical in the foreign language and English. The French-English portion occupies 15 pages, and the German-English part the remaining 121.

It will be found extremely useful for the botanical and plant physiological worker without any deep acquaintance with French and German botanical literature. As the authors realise, the work is not a complete dictionary of French and German botanical terms, but the interleaved blank pages make it possible for the possessor of the book to amplify the list of terms given in print.—W. S.

L'année biologique, 1920-21. 25th year. Paris: Masson et Cie. Trimonthly issue. Price in France, 50 fr.; abroad, 60 fr.

This first number of a new series has just arrived. Hitherto it has been under the charge of Professor Yves Delage, who is now no more, and the present number contains a full account of his life and work. In future it will be published by "La fédération des sociétés des science naturelles." It is an abstract journal, and seeks to fulfil the same functions for biologists that PHYSIOLOGICAL ABSTRACTS does for physiologists. It, however, contains a section on Physiology, which deals specially with the cytological, genetical, and morphological aspects of physiology, both animal and vegetable.—W. D. H.

OBITUARY NOTICES

DOUGLAS VERNON COW

Dr. Cow was well known as a constant attendant at our Physiological meetings. Pharmacology is poorer by his loss. The sadness of his death is accentuated by his comparative youth. He died in Cornwall, where he had gone for his health, on June 23. He was only 41 years of age. He leaves a widow, to whom we tender our sincere sympathy.—W. D. H.

JAMES ACWORTH MENZIES

We have all heard with sorrow of the sad and unexpected death of Professor Menzies of Newcastle-on-Tyne. He died of cerebral hæmorrhage on July 8 at the early age of 52. To-day we can ill spare physiologists of his type. He was not only the joint author of a well-known textbook, an enthusiastic investigator, an ardent teacher, a valued contributor to these pages, but a man of sterling character, and a faithful friend. Our deepest sympathy goes out to his widow and daughter.—W. D. H.

ERRATUM

Dr. J. Roskam writes to point out that a mistranslation of a word leads to an entire misapprehension of his work on blood-clotting (Abstract No. 1745, Vol. VI., p. 254). The word "globulins" in the original paper was translated "globulin." The term "globulins" should have been rendered "blood-platelets." It was originally used with this meaning by their discoverer, Donné, in 1844.

H. K. LEWIS & CO., LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

2418. The Application of Physical Methods to Physiology. A. V. Hill (*Science Progress*, 1921, **16,** 79-89).—A thoughtful article on a subject the author himself has done so much to further.—W. D. H.

2419. Objective Study of Neurosis. F. L. Golla (*Lancet*, 1921, ii., 215-21, 265-70, 373-9).—These Croonian Lectures are addressed to physicians, but physiologists may read them with profit. Lecture 2 includes a lengthy description of the psycho-galvanic reaction (emotive response).—W. D. H.

2420. The Effect of High Wet Bulb Temperatures on Pulse-Rate, Body Temperature, and Blood-Pressure of North Queensland Wharf Labourers. A. Breinl (*Med. J. of Australia*, 1921, i. [8th year], 303-12).—The results are presented in many columns of figures, and the work was carried out on a large scale. There was no constant bad effect on the Townsville labourers either in the holds of ships or in the sun. A slight rise in rectal temperature usually occurs, but that seems to be all.—W. D. H.

2421. Sur la variation de la teneur en zinc de l'organisme du lapin durant la croissance. G. Bertrand and R. Vladesco (*Compt. rend.*, 1921, **173,** 54-5).—In mouse, fowl, etc., the zinc content increases with age. In the rabbit the maximum is at birth; it falls off during lactation, and about the 25th day of life begins to mount rapidly. This reminds the authors of what Bunge found in reference to iron.—W. D. H.

2422. L'étude biologique des plongeurs. A. Thooris (*Compt. rend.*, 1921, **172,** 1529-32).—A radioscopic study of 2 diving champions. Records were also taken of movements in chest, nares, and larynx. Training is important in remaining any time under water; the preliminary movements are inspiration, elevation of the larynx, and closure of the glottis; then expiration with descent of larynx. Fuller details are added. —W. D. H.

2423. Eel Extract. S. Yoshimura (*Taiwan Igak. Zasshi*, 1918, No. 184, 361-2; *Jap. Med. Lit.*, 1920, **5,** 29).—Reactions of the residue in the ether extract of *Pluturus fastians* are described which are similar to those of cholesterol. This eel is used in Japan as a tonic.—W. D. H. (*Chem. Abstr.*).

APPARATUS AND METHODS

2424. An Instrument which is Set in Motion by Vision. C. Russ (*Lancet*, 1921, i., 222-4).—The idea that the gaze of a person becomes intolerable to the person stared at suggested some sort of radiation from the staring eye. Within a metal box a delicate solenoid of copper wire, wound on a celluloid cylinder, is suspended by a thread of unspun silk; the eye gazes at one end of it through a celluloid window, and the solenoid moves; if the gaze is directed to the other end, it moves the other way. Gazing does not appear to be essential; placing the hand on the box does as well; the author describes many details; among other points he thinks he has eliminated any temperature effect. Though the author is cautious in drawing conclusions as to what sort of energy proceeds from the eye, he thinks it is probably electrical, due to retinal changes.—W. D. H.

2425. Nouvelle méthode pour mesurer la vitesse de propagation de l'onde pulsatile artérielle. C. Lundsgaard and O. Beyerholm (*Compt. rend. soc. biol.*, 1921, **85,** 371-4).—The carotid and radial pulse tracings are recorded on the electrocardiogram photographically, and the time interval between them is measured.—J. H. B.

2426. Eine neue sphygmographisch-manometrische Vorrichtung. L. Söler (*Berlin. klin. Woch.*, 1921, **58,** 484-5).—A sort of polygraph is described and figured.—W. D. H.

2427. A Direct Method for Carbon Monoxide in Blood. T. K. Kruse (*J. Pharm. Expt. Ther.*, 1921, **17,** 332).—Oxygen and CO are driven off from blood by potassium ferricyanide, and collected in the Van Slyke blood-gas apparatus. The CO is then absorbed by ammoniacal cuprous chloride.—E. M.

2428. Further Improvements in the Nephelometer Colorimeter. P. A. Kober and R. E. Klett (*J. Biol. Chem.*, 1921, **47,** 19-25).—Describes certain convenient improvements to the well-known Kober colorimeter.—H. E. R.

2429. On the Substitution of Turbidimetry for Nephelometry in Certain Biochemical Methods of Analysis. W. Denis (*J. Biol. Chem.*, 1921, **47,** 27-31).—Turbidity measurements are preferred to nephelometric measurements.—H. E. R.

2430. Erweiterung der Vereinfachten Indikatormethode. L. Michaelis (*Deutsch. med. Woch.*, 1921, **47,** 673).—A further practical note which will be specially useful in bacteriology, and which those interested should consult.—W. D. H.

2431. The Kjeldahl Method. H. W. Daudt (*J. Assoc. Off. Agric. Chem.*, 1921, **4,** 366-73).—Investigation of this method and its modifications showed that the proportion of H_2SO_4 to alkali sulphate is important; with 10 gm. of K_2SO_4 or 8·2 gm. of Na_2SO_4, 20 to 25 c.c. of H_2SO_4 effect the most complete decomposition of a substance. The time of boiling, apart from the preliminary digestion, should be at least 2 hours, unless a shorter period is known to be effective for any particular substance. A quantity of $CuSO_4$ not exceeding 0·5 gm. does not cause retention of ammonia, but $CuSO_4$ is not as effective as mercury. Sodium thiosulphate may be used in place of potassium sulphide for decomposing ammonium mercury compounds.—W. D. H. (*J. C. Soc.*).

CHEMICAL

2432. Über den Einfluss des Wassergehaltes auf die Adsorptionsleistung einer aktiven Kohle. H. Herbst (*Biochem. Zeit.*, 1921, **118,** 103-19).—The highest adsorption is obtained with dry charcoal. For practical purposes 10% of water is not harmful, since the presence of water has a catalytic effect.—H. K.

2433. Über Eisensalze der Dipyrrylphenylmethanfarbstoffe und über Triphenylpyrrylmethane. H. Fischer and V. Luckmann (*Zeit. physiol. Chem.*, 1921, **115,** 77-93).—Aromatic aldehydes and pyrrols condense, giving dipyrryl-phenylmethanes, which on oxidation yield dyes analogous to the triphenylmethane series. This paper extends work already published.—H. W. D.

2434. Carbonsäure-Ester als amphotere Elektrolyte. H. v. Euler and O. Svanberg (*Zeit. physiol. Chem.*, 1921, **115,** 139-46).—Measurements of the constant (Ka) in the formula defining the isoelectric point of ethyl acetate.—H. W. D.

2435. Die Bestimmung von Dextrose und Lävulose in einer Losung. H. Murschhauser (*Biochem. Zeit.*, 1921, **118,** 120-8).—This is accomplished by estimating the total reducing power by Pflüger's method (*Arch. f. d. ges. Phys.*, 1906, **114,** 242) and the optical rotation.—H. K.

2436. Drehungserscheinungen von Dextrose in Lösungen von tertiärem Natriumphosphat. Die Mutarotation als analytische Methode. H. Murschhauser (*Biochem. Zeit.*, 1921, **117,** 215-26).—The mutarotation of dextrose is accelerated by trisodium

phosphate. It follows a unimolecular law, the velocity constants being a linear function of the concentration of sodium phosphate. As the mutarotation is a function of the hydroxyl ion, the author proposes to use it for distinguishing salts of different alkalinity.—H. K.

2437. Preparation of Galactose from Lactose. E. P. Clark (*J. Biol. Chem.*, 1921, **47,** 1-2).—Of chemical interest only.—H. E. R.

2438. Interprétation des propriétés optiques des grains d'amidon en lumière polarisée. J. Gillis (*Bull. de la soc. chim. de Belgique*, 1921, **30,** 114-9).—Un grain d'amidon, formé d'une superposition concentrique ou excentrique de couches nettement marquées, produit, entre nicols croisés, une dépolarisation de la lumière, sauf aux endroits où la tangente à chacune des couches du grain est parallèle ou perpendiculaire à la direction de vibration du nicol polariseur. L'intersection des barres noires est toujours au voisinage immédiat du hile et à la surface du grain.—E. Z.

2439. L'inuline. E. Bourquelot and M. Bridel (*Bull. de la soc. de chim. biol.*, 1921, **3,** 217-25).—Inulin hydrolysed by the inulase of *Aspergillus niger* yields fructose only; no glucose was obtained.—W. D. H.

2440. Cholesterol.—XXXI. The Differing Behaviour of Stereo-isomeric Derivatives. A. Windaus and A. v. Staden (*Ber. deutsch. chem. Ges.*, 1921, **54B,** 1059-66).—Of purely chemical interest.—W. D. H. (*J. C. Soc.*).

2441. Verdauungsversuche mit Albumosen, die durch Alkalieinwirkung gewonnen sind. H. Langecker (*Zeit. physiol. Chem.*, 1921, **115,** 130-8).—Proteoses prepared from various proteins by mild hydrolysis with NaOH were subjected to the action of trypsin. It is found that the enzyme has practically no action, as would be expected, since the alkali proteoses are of necessity "racemised" in the process of preparation.—H. W. D.

2442. Die elektrische Ladung des Hämoglobins. L. Michaelis and Y. Airila (*Biochem. Zeit.*, 1921, **118,** 144-9).—Cataphoretic experiments show that hæmoglobin behaves as a complex ampholyte. At the isoelectric point the cataphoretic movement is nil, and with increasing or decreasing P_H there is a continuous increase in the cataphoretic velocity. These results disprove Straub and Meier's contention (Abstracts Nos. 3306, Vol. III., p. 561, and 2923, Vol. V., p. 466).—H. K.

2443. Le dosage colorimétrique de la tyrosine. P. Thomas (*Bull. de la soc. de chim. biol.*, 1921, **3,** 197-216).—Folin and Denis' method is inexact for estimating tyrosine in products of protein hydrolysis; it is influenced by the presence of tryptophane and its derivatives, also by reducing substances. A colorimetric method based on the Hoffmann-Millon reactions enables one to determine a phenolic index, but not the amount of tyrosine. The gravimetric method is the only one available for accurate work, but even this may have to be revised in the light of the work of Abderhalden and Fuchs on the rôle of diamino-acids in the isolation of tyrosine.—W. D. H.

2444. Sur la pureté des tyrosines commerciales. A. Berthelot and Mlle. Ossart (*Bull. de la soc. de chim. biol.*, 1921, **3,** 247).—Many of the specimens examined contained peptone or barium. The latter would be specially harmful in bacteriological work.—W. D. H.

2445. Über Azofarbstoffe des Bilirubins—I. H. Fischer and H. Barrenscheen (*Zeit. physiol. Chem.*, 1921, **115,** 94-104).—Preliminary work in which the authors confirm the finding of Orndorf and Teeple that in Ehrlich's well-known bilirubin diazo-reaction 2 dyes (monazo- and diazo-derivatives) are formed. H. v. d. Bergh's clinical application of the reaction to the estimation of bilirubin in the blood is shown to give erroneous results.—H. W. D.

2446. Sulla origine delle melanine dal pirrolo—II. P. Rondoni (*Lo sperimentale*, **1-3,** 33-44; compare Abstract No. 1181, Vol. VI., p. 174).—Further experiments on the action of pyrrole on extracts of frog's skin, and of tissues of rabbits and guinea-pigs, and also on the ink of sepia, are described which support the author's views — W. D. H.

2447. Le rôle compensateur des chlorures dans ses rapports avec la composition chimique des humeurs. W. Mestrezat and Mlle. S. Ledert (*Compt. rend.*, 1921, **172,** 1607-10).—So far as I can understand their paper, the authors assign to chlorides a power of compensation so that fluids less rich in colloids than the blood are nevertheless in physico-chemical equilibrium with it. They describe some experiments (to support this view) of introducing collodion sacs with saline contents into the peritoneum of dogs, rabbits, and guinea-pigs, and examining them some days later; but the details are so few that they are difficult to understand.—W. D. H.

2448. Sur le brome existant normalement dans les tissues animaux. M. A. Damiens (*Bull. de la soc. chim. biol.*, 1921, **3,** 95-104).—A method for estimating the amount of chlorine, bromine, and iodine in tissues is given; the method is very long and elaborate. Results are given for various tissues, the amount of bromine being practically constant in all the organs examined (0·3%). Analyses of tissues from animals poisoned by bromine are also given, and their significance discussed. In these cases the amount of bromine may rise to 2%.—E. P.

2449. Über die chemische Zusammensetzung von menschlicher Nägeln aus verschiedenen Lebensaltern. H. Langecker (*Zeit. physiol. Chem.*, 1921, **115,** 38-42).—Water, ether extract, ash, nitrogen, and sulphur determinations on human nails. The composition of the nails is reasonably constant, irrespective of age or condition of health.—H. W. D.

ENZYMES

2450. Chemistry of Enzymes. T. Bokorny (*Allgem. Brau. Hopfenzeit.*, 1921, 121-2, 129-30, 133-4).—The action of nitrous acid on enzymes, whereby the nitrogen corresponding with the amino-nitrogen present is set free, has been studied. Under standard conditions pepsin was found to contain 3·16, emulsin 4·17, rennet powder 3·05, hen-egg albumin (Kahlbaum), 3·281%. Trypsin in neutral solution is completely absorbed by kaolin and alumina; it is amphoteric, combining with 3% of ammonia and 2 to 5% of sulphuric acid. Pepsin in neutral solution is incompletely absorbed by kaolin, but completely by alumina; it is also amphoteric, but somewhat more acidic than basic; combination with acids and bases could not be demonstrated. Invertase in neutral solution is not absorbed by kaolin, and only incompletely by alumina; it is acidic in character.—W. D. H. (*J. C. Soc.*).

2451. Oxidase et oxhydridase. Oxydation et hydrolyse. J. E. Abelous and J. Aloy (*Compt. rend. soc. biol.*, 1921, **85,** 331-3).—Extract of horse's liver can hydrolyse benzaldehyde, so that part is reduced to the alcohol and part oxidised to the acid. If a hydrogen acceptor be present (*e.g.*, methylene blue), only the acid is formed, and oxidation only takes place. Hence tissue oxidations taking place in the absence of oxygen are really hydrolytic fermentations where reduction is suppressed by hydrogen acceptors.—J. H. B.

2452. Synthesis of Urea by Urease. H. P. Barendrecht (*Rec. trav. chim.*, 1920, **39,** 603; 1921, **40,** 66). T. J. F. Mattaar (*ibid.*, **40,** 65).—Polemics. The first author thinks he has obtained evidence of such synthesis; the second rejects the evidence.—W. D. H. (*Chem. Abstr.*).

2453. "Gibt es Abwehrfermente gegen Polysaccharide?" E. Abderhalden (*Biochem. Zeit.*, 1921, **117,** 161-5).—Polemical against Herzfeld and Klinger.—H. K.

2454. Die Bedeutung der Acidität für die Oxynitrilsynthese und die Nichtexistenz des Rosenthalerschen syn-Emulsins. E. Nordefeldt (*Biochem. Zeit.*, 1921, **118,** 15-33).—The author shows that the formation of benzaldehydecyanhydrin is largely conditioned by the P_H of the solution, the synthetic action increasing rapidly with increase of P_H.

The enzymatic nature of emulsin in this reaction is an unnecessary assumption, the increased velocity in its presence being due to removal of H-ions by adsorption of benzoic acid. The specificity of emulsin in producing optical activity in the oxynitrile formed is not necessarily enzymatic, as the results of Fajans (*Ber. deutsch. chem. Ges.*, 1908, **41,** 752) with quinine and quinidine have shown.—H. K.

2455. Das Enzym Phosphatase-Phosphatese. H. P. Barendrecht (*Biochem. Zeit.*, 1921, **118,** 254-5).—The author considers that Euler and Ohlsén's experiments (*ibid.* **37,** 314) support the radiation hypothesis of enzyme action, and that the 2 enzymes, named are identical.—H. K.

2456. Über Darm-Saccharase. H. v. Euler and O. Svanberg (*Zeit. physiol. Chem.*, 1921, **115,** 42-67).—The activity of the enzyme was studied in various regions of the intestine, and found to be greatest in the jejunum. The optimal acidity for human intestinal saccharase is P_H 6 to 8, which is only $\frac{1}{50}$ of that for yeast saccharase. The authors suspect that the enzyme is contained in the epithelial cells of the mucous membrane.—H. W. D.

2457. Über die Temperaturempfindlichkeit des rohrzuckerspaltenden Enzyms des menschlichen Jejunum. H. v. Euler and K. Myrbäck (*Zeit. physiol. Chem.*, 1921, **115,** 68-76).—The enzyme of the human jejunum shows a greater sensitiveness to heat than the corresponding yeast saccharase.—H. W. D.

2458. Nachtrag zu unserer Mitteilung: Über die Charakterisierung von Amylaselösungen. H. v. Euler and O. Svanberg (*Zeit. physiol. Chem.*, 1921, **115,** 179).—Correction of calculation in a previous paper (Abstract No. 741, Vol. VI., p. 112).—H. W. D.

2459. Über die spezifische Natur von Saccharase und Raffinase. R. Willstätter and R. Kuhn (*Zeit. physiol. Chem.*, 1921, **115,** 180-98).—By determining the relative activities of various invertase preparations with respect to the hydrolysis of cane-sugar and raffinose, it is shown that the 2 enzymes concerned are specific, and it may be that each of the higher fructosides has its own specific enzymes. It seems impossible to fractionate saccharase and raffinase by any of the usual methods.—H. W. D.

2460. Über die Verschiedenheit von Maltase und α-Glukosidase—III. R. Willstätter and W. Steibelt (*Zeit. physiol. Chem.*, 1921, **115,** 199-210).—By methods similar to those in the preceding paper it is shown that maltase and α-glucosidase are 2 distinct enzymes.—H. W. D.

2461. Über die oligodynamischen Wirkung metallischen Kupfers und Silbers auf Diastase. A. Luger (*Biochem. Zeit.*, 1921, **117,** 153-60).—Diastase inactivated by contact with metals is more or less reactivated by treatment with certain salts such as potassium cyanide and sodium thiosulphate.—H. K.

PHYSIOLOGY OF INVERTEBRATES

2462. The Toxicity of Acids to Infusoria—II. M. E. Collett (*J. Exp. Zool.*, 1921, **34,** No. 1).—The addition of HCl to solutions of organic acids does not yield conclusive evidence as to the toxicity of the molecule. Mixtures of certain acids (formic, acetic, butyric, valeric, benzoic, salicylic, with Paramœcium and Euplotes, and citric with Euplotes only) with their Na salts are more toxic than can be accounted for by the P_H of the mixture or the toxicity of the salts. This seems to indicate that the molecules of these acids are in themselves toxic. There is no evidence of toxicity of the anion or the molecule in lactic, succinic, or tartaric acid at the concentrations used. The relative toxicity of 0·01 *M* solutions of the Na salts is as follows: Paramœcium—salicylate, benzoate, tartrate, succinate, citrate, formate, acetate, butyrate, valerinate, chloride, lactate; Euplotes—citrate, salicylate, benzoate, tartrate, succinate, formate, chloride, acetate, butyrate, valerinate, lactate.—W. D. H. (*W. I.*).

2463. The Toxicity of Acids to Infusoria—III. M. E. Collett (*J. Exp. Zool.*, 1921, **34,** No. 1).—Length of life in solutions of various acids is extended by the addition of inorganic chlorides. The acids tested fall into two groups: the first includes HCl, formic, acetic, succinic, lactic, tartaric, citric; the second includes butyric, caproic, benzoic, salicylic, phenylacetic. The relative antagonistic power of the chlorides is set out. NaCl increases the antagonistic power of $BaCl_2$ and $MgCl_2$ against all acids, but that of $CaCl_2$ and $SrCl_2$ only against acids of the second group. The action of the salts is probably double. Each has some influence upon phase reversal, and thus upon the rate of penetration of the acid; and each also stabilises the cell colloids against the swelling or coagulative action of the H-ion.—W. D. H. (*W. I.*).

2464. Metabolic Gradient in Annelids. Libbie H. Hyman and A. E. Galigher (*J. Exp. Zool.*, 1921, **34,** No. 1).—By means of the susceptibility and electrical methods, evidence has been accumulated which clearly indicates the existence of a double metabolic gradient in the oligochætes and polychætes. The anterior and posterior ends possess the highest metabolic rate, and from these ends the rate decreases toward the middle regions.—W. D. H. (*W. I.*).

2465. Les parois de certains animaux marins halisotoniques sont biologiquement semiperméable. M. C. Dekhuyzen (*Arch. néerl. de physiol.*, 1921, **5,** 563-71).—Marine invertebrates contain fluids (blood, etc.) isotonic with sea water, especially so far as chlorides are concerned; hence the term halisotonic. The paper records many experiments, especially on sipunculous worms (which lend themselves admirably to osmotic experiments); how these animals acquire and preserve their halisotony in spite of the biological semipermeability of their body walls is unanswered, for the author admits his suggestions do not solve the difficulty.—W. D. H.

2466. Hatching of Aphis Eggs. A. Peterson (*Ann. Entom. Soc.*, America, 1921, **13,** 391-400).—The moisture of the air is the main factor; low humidity hinders, high humidity favours, hatching.—W. D. H. (*Chem. Abstr.*).

2467. Sur la résistance du hanneton adult aux basses et hautes temperatures. H. Faes and M. Staehelin (*Compt. rend.*, 1921, **173,** 61-4).—Farmers believe that the winter's cold destroys cockchafers. The authors find that they are very resistant to cold, $-8°$ C. being necessary to kill them, and this temperature is not reached in the French vineyards. The upper limit of resistance is $+45°$.—W. D. H.

2468. Der Umdrehreflex bei Seesternen und Schlangensternen. E. Mangold (*Pflüger's Arch.*, 1921, **189,** 73-98).—In starfish (Asteroidea) and in brittle-stars (Ophiuroidea) the reflex centre is in the radial nerve, nerve cells at the central end of which effect co-ordination between the different arms. The receptors are in the skin of the dorsum of the arms.—C. L. E.

2469. Nervous System of the Tunicate. II. The Relation of the Nerve Ganglion to the Heart. E. C. Day (*J. Exp. Zool.*, 1921, **34,** No. 1).—The normal activity of the heart of *Ascidia mentula* exhibits alternating series of beats designated as ventrad and dorsad. The slicing of pieces off the tunic, severing the nerves between ganglion and heart, and extirpation of the ganglion cause the beats to be accelerated. The effects of stimulations and operations disappear in the course of an hour or a day, and the heart reverts to its original normal rate and number of beats. From the data in hand it cannot be said that the heart is under the control of the nerve ganglion.—W. D. H. (*W. I.*).

CELLS AND TISSUES

2470. Über den Zusammenhang von Dunkelwirkung fluorescierender Stoffe und Photodynamie auf Zellen. A. Jodlbauer and F. Haffner (*Biochem. Zeit.*, 1921, **118,** 150-7).—A large number of fluorescent and non-fluorescent substances of known photo-

dynamic action on cells—*e.g.*, paramœcia—have been examined in respect of their action in the dark, on the hæmolysis of erythrocytes at room temperature and at 56°, and in the flocculating property on the colloidal contents of hæmolysed corpuscles at 56°. In general there is a parallelism between the two.—H. K.

2471. Zur Frage der postmortalen Autolyse der Zellgranula. Oka (*Virchow's Arch.*, 1920, **228**, 200-15).—A description of the relative amount of autolysis in different tissues of the rabbit under various conditions.—W. D. H.

2472. Aldehydes as Mordants in the Staining of Fats and Lipoids. J. L. Smith and T. Rettie (*J. Path. and Bact.*, 1921, **24**, 364-5).—Preliminary communication.—W. E. G.

2473. The Mechanism of Ciliary Movement. J. Gray (*Proc. Camb. Phil. Soc.*, 1921, **20**, 352-9).—Each cilium is described as having (1) a forward or effective beat, behaving during this phase as an elastic rod moving forward from a pivot at its base, and exposing maximum surface to the medium; and (2) a recovery stroke in which each cilium may be likened to a fishing line during the backward movement of the cast, or to a piece of unstretched rubber in which a stress is set up at the base and is transmitted to the free end. During the effective beat energy is expended, and during the recovery stroke energy is stored. An analogy is drawn between the mechanism of ciliary movement and contraction of muscle fibres; the effects of acid and alkali, of metallic ions and of osmotic pressure, are considered to support this.—J. A. H.

2474. La radiopuncture microscopique des cellules mobiles. S. Tchahotine (*Compt. rend.*, 1921, **172**, 1679-81).—The author has extended his method to other cells (Abstract No. 125, Vol. VI., p. 16), and describes the immobilisation produced in infusoria, and contraction and protuberances produced in Colpidium.—W. D. H.

2475. Über das Verhalten von Zellmembranen gegen Eisensalze. L. Rosenthaler (*Ber. deutsch. pharmazeut.*, 1921, **31**, 27-30).—Some cell membranes take up iron in an ionising form which at once reacts with potassium ferrocyanide, while other cell membranes take up iron in a non-ionising form (probably as hydroxide) which requires treatment with acid as well as with potassium ferrocyanide before Prussian blue is precipitated.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2476. The Golgi Apparatus and its Relationship to Holmgren's Trophospongium in Nerve Cells. Comparison during Retispersion. W. G. Penfield (*Anat. Rec.*, 1921, 22, No. 2; compare Abstract No. 3309, Vol. V., p. 525).—The 2 structures may be demonstrated successively or simultaneously in the cytoplasm of the same neuron.—W. D. H. (*W. I.*).

2477. Dictyokinesis in Germ Cells, or the Distribution of the Golgi Apparatus during Cell Division. R. J. Ludford and J. B. Gatenby (*Proc. Roy. Soc.*, 1921, **92B**, 235-44).—Maturation mitoses in the germ cells of Cavia, Mus, Helix, Limnæa, and Stenobothrus were examined in order to ascertain the fate of the Golgi apparatus during cell division. In all cases the apparatus is found to separate or break up into its constituent granules or rods, and these are distributed haphazardly to the 2 daughter cells at mitosis. The Golgi apparatus is in no case examined divided out between the daughter cells as carefully and equally as are the chromosomes. This appears to show that from the point of view of a mathematical conception of the hereditary processes the Golgi apparatus does not share to any important extent, if at all, in the transmission of factors from cell to cell.—*Author's Abstract.*

2478. Die Frage der Neubildung von Zellen im erwachsenen Organismus. C. Wegelin (*Schweiz. med. Woch.*, 1921, **51**, 217-23).—A study of the conditions under which new cells can be formed in a fully-grown organism to replace those which die or are sloughed off. The more highly specialised a tissue, the greater the difficulty of regeneration. The chief factor in regeneration is a property of the cells in virtue of which they react

to disturbance of their equilibrium condition by growth and division. During the period of such activity new inheritable characters may appear. Tissues in which vigorous regeneration is possible are most prone to the formation of tumours.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2479. La cellule hépatique du hérisson. L'évolution cytogénétique du pancreas du hérisson. P. R. Chaves (*Bull. de la soc. portugaise des sci. nat.*, 1920, **8,** 165-78, 199-210; compare Abstracts 1199, 1201, Vol. VI., pp. 177-8).—More details are added to those published before, relating to granules, vacuoles, mitochondria, etc., and the changes they undergo during development.—W. D. H.

2480. Fibrin and Serum as a Culture Medium. A. H. Ebeling (*J. Exp. Med.*, 1921, **33,** 641).—A medium composed of $\frac{1}{4}$ volume of fibrogen suspension, $\frac{3}{4}$ volume of chicken serum, and 1 volume of embryonic juice was found to be practically equal to the usual medium (equal volumes of chicken plasma and embryonic juice) for the cultivation of tissues *in vitro*. The tissue used in the test was a strain of connective tissue in its 9th year *in vitro*.—W. E. G.

2481. The Cultivation of Liver Cells of the Chick Embryo in Vitro. Ruth S. Lynch (*Amer. J. Anat.*, 1921, **29,** No. 2).—The best cultures of liver cells in Locke-Lewis solution were obtained from embryos of 5 to 12 days' incubation. The cells migrated from the explant along the cover-glass without division. The mitochondria were abundant, and in the form of granules varying in size. Bright green bile granules were occasionally seen in the cells. These had a great affinity for neutral red. Cytoplasmic or degeneration granules and vacuoles gradually accumulated; they took up neutral red rapidly and trypan blue slowly, and as the cells died they lost the neutral red rapidly and the trypan blue slowly. When the dyes were used together, each granule took up both and varied in colour, according to the relative strengths of the two dyes. Fat globules were more numerous in cells from older embryos, but they did not increase with the age of the culture. Degeneration occurred by vacuolisation or bleb formation. Mesenchyme (probably endothelium), in the form of a loose reticulum, was often present. Isolated wandering cells (clasmatocytes ?) were not numerous. Mesothelial membranes were rarely observed. Fibrin or a fibrin-like substance accumulated in the medium of most of the cultures, sometimes more or less obscuring the outgrowths.—W. D. H. (*W. I.*).

2482. The Germ Centre in Lymphoid Tissue. W. Nakahara and J. B. Murphy (*Anat. Rec.*, 1921, **22,** No. 2).—In artificially induced lymphoid stimulation in animals it was found that a marked increase in the number of mitotic figures in lymphoid germ centres occurs preparatory to the manifestation of lymphocytosis in the blood. This offers an experimental support to Flemming's theory by indicating the lymphoblastic nature of the so-called germ centres of lymphoid organs.—W. D. H. (*W. I.*).

2483. The Histogenesis of Lymphatic Tissue of the Intestine. J. S. Latta (*Amer. J. Anat.*, 1921, **29,** No. 2).—The purpose was to determine the origin and development of the various types of blood-cells in and about the intestinal lymphatic nodules in the cæcal region of the rabbit. The first free cells to appear were small lymphocytes which developed from mesenchymal cells. A few lymphoid hæmoblasts also arose by transformation of mesenchymal cells. These 2 types are apparently 2 different growth stages of the same cell, the small lymphocytes by growth becoming hæmoblasts, and the latter by repeated divisions being reduced to small lymphocytes. The presence of large acidophilic macrophages derived by further differentiation of lymphoid hæmoblasts and of degenerating small lymphocytes indicates that the so-called germinal centre is rather a degenerative centre than a centre of proliferation. Eosinophiles of binucleated form develop in the connective tissue near the nodules, especially in the tunica propria. Abundant extravascular erythropoiesis is found in the sub- and

internodular connective tissue, the erythroblastic cells differentiating from lymphoid hæmoblasts. The development of the 3 types of blood-cells seems in some way related to the vascular supply. Formation of nodular lymphatic tissue may be dependent upon nutritive conditions furnished by the blood. Further differentiation of lymphoid hæmoblasts probably depends upon closeness of association with the bloodvessels, slowness of the current, and thickness of the vascular walls, very intimate relation between hæmoblasts and the blood-stream causing erythropoiesis, and more remote connection causing granulopoiesis.—W. D. H. (*W. I.*).

2484. Vacuoles and Granules in Cells of Connective Tissue and Blood. Rosa E. Prigosen (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 206-11).—Granules with an affinity for neutral red accumulate in the cytoplasm of fibroblasts and red cells in film preparations from chick embryos. Though found in many kinds of degenerating cells, they are absent in dead cells. The white cells of human blood also develop similar vacuoles or granules in films. They are probably not normal attributes of the cells, and are distinct from mitochondria which stain with janus green.—W. D. H.

2485. Über Kalkbindung durch tierische Gewebe—III. E. Freudenberg and P. György (*Biochem. Zeit.*, 1921, **118,** 50-4).—Cartilage which has absorbed the alkaline earth metals has also the power of fixing P_2O_5. The colloids of the cartilage are assumed to play a part in this chemical combination.—H. K.

2486. The Specific Precipitin Reaction of the Lens. L. Hektoen (*J. Amer. Med. Assoc.*, 1921, **77,** 32-3).—Lens proteins appear to be chemically identical in very diverse species, and species-specific precipitinogens are absent. Lens proteins appear to be present in the aqueous and vitreous humours, and the origin or destination of these proteins is obscure.—C. L. E.

2487. Bone Formation in Fallopian Tube. G. Asami (*Amer. J. Med. Sciences*, 1921, **160,** 107-18).—A case of aberrant bone formation (prefigured by cartilage) in the tube is presented.—W. D. H.

MUSCLE

2488. Innervation of Striped Muscle Fibres and Langley's Receptive Substance. J. Boeke (*Brain*, 1921, **44,** 1-22).—Introductory remarks emphasising recent growth of histological evidence of the interconnection of cells throughout the body tissues. The motor endings in muscle are then described as showing the hypolemmal neuro-fibrils forming a reticulum over the sarcoplasm, and from this reticulum a finer "periterminal" net extending through the sacroplasm of the sole to the myofibrillæ themselves. This net passes "into the anisotropic discs of the myofibrillæ," and forms "an extremely delicate network throughout the whole thickness of the discs." "It is of sarcoplasmic origin." Severance of the motor nerve entails disappearance of the neuro-fibrillar reticulum in 2 to 3 days, and then of the "periterminal" network. This latter returns after the neuro-fibrillar reticulum has regenerated. It is suggested that the periterminal network is the morphological expression of the receptive substance of Langley (1905) or Keith Lucas's excitable substance β (1907), or both. A "periterminal network" exists similarly in the Boeke sympathetic endings in striped muscle fibres. Analogous networks are seen in the "tactile disc" between the paired intracapsular cells of the Grandry corpuscle; there it connects an intracellular net with the afferent nerve fibre's neuro-fibrils; so similarly in the organ of Eimer and in the pig's snout tactile cells. Twelve excellent figures illustrate the text.—C. S. S.

2489. Sur l'échange des muscles dans les diverses conditions mécaniques de leurs contractions. G. Galeotti (*Arch. ital. de biol.*, 1920, **70,** 115-49).—A comprehensive

study of the heat production, gaseous exchange, and acid formation in frog's muscle under various conditions of activity, including isotonic and isometric rhythmic contractions, tetanus, veratine twitches, and work performed on the work collector. The mechanical efficiency was found to be markedly greater during a series of isotonic contractions than during the same number of contractions on the work collector. The relative heat production was greater during isometric twitches than during the performance of effective work, but was not very different from that during isotonic contraction. During tetanus the heat production is somewhat delayed as compared with the actual degree of contraction at any moment. Veratrinised muscles give an increased but somewhat variable heat production. The oxygen uptake was highest during isometric contractions, somewhat less during isotonic contractions, and least of all during effective work. A smaller oxygen uptake occurred during isometric than during isotonic tetanus. The increase of H-ion concentration was measured electrometrically. It was greatest in effective work, less in isometric contractions, still less in isotonic tetanus, and least of all in isotonic contractions.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2490. Break Shock Reflexes and " Supra-Maximal " Contraction Response of Mammalian Nerve Muscle to Single Shock Stimuli. C. S. Sherrington (*Proc. Roy. Soc.*, 1921, **92B,** 245-58).—The maximal twitch contraction of tibialis anticus muscles (cat) evoked by a single break shock applied to the cut motor nerve is compared with the same muscle's contraction as evoked reflexly (spinal preparation) by a single break shock applied to an afferent nerve. The reflex contraction is found to exceed the former when the break shock for the former is even considerably weaker than that employed for the latter. Evidence is given that this is due to the reflex response being tetanic in nature. If the break shock is, however, quite strong (*i.e.*, above the limiting maximal value of Forbes and Gregg), there is evidence that it excites, even when applied to the motor nerve, a response of tetanic quality. The so-called " over-maximal twitch " is in reality a response of this kind. Such responses are termed " supra-maximal responses." Probability is shown that a reaction of like kind obtains in the afferent nerve when the single shock applied to it is of comparably high value. In this latter case there is added to the tetanic reaction of the spinal centre a tetanic reaction from afferent nerve fibres themselves. But with weak and moderate break shock stimuli the seat of origination of the tetanic character of the reflex discharge appears to lie mainly, if not wholly, in the centre itself. It is inferred that it arises there from a process, a " charge " process, which is relatively long-lasting in comparison with the cycle of a nerve impulse, a process which is more intense and of longer duration when the afferent fibres excited are many than when they are fewer.—*Author's Abstract.*

2491. Die Umwandlung der chemischen Energie im Muskel. E. Schmitz (*Berlin. klin. Woch.*, 1921, **58,** 341-5). **Theorie der Muskelkontraktion.** K. Hürthle (*ibid.*, 345-7).—The first paper deals chiefly with lactic acid, and explains the views of Fletcher, Hopkins, Meyerhof, and others. The second paper considers the subject under the heads of surface tension, osmotic pressure, and swelling of colloids (Quellung).—W. D. H.

2492. Über die reziproke Innervation. Pfahl (*Pflüger's Arch.*, 1921, **188,** 298-302).—The author claims that the reflex relaxation of an antagonistic muscle is not exactly proportional to the shortening of the contracted muscle.—C. L. E.

2493. Sobre el mecanismo de curarizacion de neustros batracios. J. Guglielmetti and G. Pacella (*La prensa méd. Argentina*, 1921, Nos. 24-30).—See Abstract No. 1710, Vol. VI., p. 248.—B. A. H.

2494. Der Verlauf der Totenstarre am isolierten und am in situ belassenen Skelettmuskel von Säugern. E. Mangold (*Pflüger's Arch.*, 1921, **189,** 99-108).—Although there are certain differences in the time relations, these are not regarded as sufficiently great to invalidate the application of results on isolated muscles to the intact animal.—C. L. E.

2495. Beiträge zur Physiologie der Reizerzeugung. II. Darm. III. Skelettmuskel. G. Mansfeld (*Pflüger's Arch.*, 1921, **188**, 241-6, 247-53).—II. Experiments by methods akin to those used for a similar investigation on the heart-beat (Abstract No. 3437, Vol. V., p. 546), and purporting to prove that CO_2 acts as an automatic stimulus to the intestinal movements. III. The indirect excitability of muscle is lost when all CO_2 is removed from it, and is restored again by CO_2. The excitability and conductivity of muscle and of nerve separately are unchanged by removal of CO_2.—C. L. E.

2496. Die Totenstarre des Säugermagens. E. Mangold (*Pflüger's Arch.*, 1921, **188**, 303-21).—Changes in length of stomach strips, kept in a moist chamber at room temperature, were recorded. Relaxation occurred first, followed in about 1 hour by shortening, which was complete in about $5\frac{1}{4}$ hours. Resolution of rigor begins in about $9\frac{1}{2}$ hours. Rigor is said to be more rapid than in skeletal muscle. Rhythmic contractions were sometimes seen to persist until the maximum of rigor had been reached.—C. L. E.

NERVE. REFLEX ACTION

2497. Lésions et restaurations nerveuses. E. Couvreur (*J. de physiol. et de pathol. gén.*, 1921, **19**, 173-86).—In the dog, section of a large nerve, such as the sciatic, is only followed by transitory disturbance of locomotion. The immediate restoration of function after suture is illusory. True restoration only takes place when axons have grown down from the central end. A nerve compressed by connective tissue must be freed. False trophic changes, due to abrasion or infection, must be distinguished from genuine ones. The latter are not due to a deprivation of nervous influence, but to irritation of the nerve. There are no real trophic nerves, and the effects observed are due to the indirect effect of vascular changes. These latter may give rise to trophic changes, such as ulceration, even if the nerves are intact.—W. M. B.

2498. Augmentation de la chronaxie du nerf par les solutions hypertoniques. L. and M. Lapicque (*Compt. rend. soc. biol.*, 1921, **85**, 210-3).—Whilst up to the present no pharmacological means has been found of increasing the chronaxie of nerves, hypertonic solutions have this effect. The experiments were carried out on the sciatic-gastrocnemius preparation of the frog with solutions of saccharose. The chronaxie was increased 4 times by a solution of which $\Delta = 3{\cdot}6°$.—J. H. B.

2499. Evolution de la chronaxie des nerfs et muscles du membre supérieur des nouveau-nés. G. Banu and G. Bourguignon (*Compt. rend. soc. biol.*, 1921, **85**, 349-52; see Abstract No. 2015, Vol. VI., p. 304).—The authors give values for the chronaxie of the neuromuscular apparatus of the upper limb of the child until these values become identical with those for adults.—J. H. B.

2500. De la sensibilité chimique des terminaisons du pneumograstrique pulmonaire. A. P. Suñer and J. M. Bellido (*J. de physiol. et de pathol. gén.*, 1921, **19**, 214-5).—The effects of CO_2 previously described are obtained when the nerve centres of the dog under experiment are supplied with blood from another dog. They are absent if the vagi are cut. Hence the vagus endings in the lung are directly sensitive to CO_2.—W. M. B.

2501. The Modification of the Crossed Extension Reflex by Light Etherisation and its bearing on the Dual Nature of Spinal Reflex Innervation. A. Forbes (*Amer. J. Physiol.*, 1921, **56**, 273-312).—The decerebrate cat in a particular stage of ether narcosis shows a modification of the crossed extension reflex from strong stimulation of an afferent nerve in the opposite limb. During the stimulation the contraction of the knee extensor is only partial, but is followed, on cessation of the stimulation, by a distinct increase.

Taken in connection with the reversal effects of chloroform and strychnine and the reflex rebound after inhibition, the observation suggests that two antagonistic reflexes are evoked simultaneously from a single afferent nerve, one or the other masking the opposite effect, which is always present. In view of the all-or-none law, the differences in the effects of different afferent stimuli must be due to differences in the number of fibres stimulated and in the frequency of response of each fibre. Several afferent paths or their central connections must converge on a single motor neuron. An attempt is made on the basis of these facts to see how far K. Lucas's analysis of the Wedensky inhibition can be applied to reflexes. The central balancing of inhibitory and excitatory effects is not an insuperable obstacle. The fact that reflex inhibition can be produced by a single shock of moderate intensity is more difficult. The reversal of excitation to inhibition by chloroform can be explained by increase of decrement at the synapse. Reciprocal innervation requires branches arranged so that impulses shall converge on the pre-motor neurons with appropriate frequencies. Rhythmic alternation may be due, as suggested by Graham Brown, to cross connections. This important paper cannot be adequately dealt with in an abstract.—W. M. B.

2502. Changes in Peripheral Nerves caused by Local Anæsthetics. K. Uyeda (*Kyoto Igaku Zasshi*, 1918, **15,** 127-52; *Jap. Med. Lit.*, 1920, **5,** 33).—Histological changes are produced in hens by the perineural injection of cocaine and its allies. Congestion of the vessels occurred, accompanied by infiltration of the walls of the veins with round cells, swelling and desquamation of the endothelial cells, and a swelling of the axis cylinders and medullary sheaths, which subsided after 6 to 12 hours. Novocaine produced the least marked changes. Cocaine produced the most marked change in the endothelial cells.—W. D. H. (*Chem. Abstr.*).

2503. De l'orientation latérale sensorielle, auditive et gyrative. L. Bard (*J. de physiol. et de pathol. gén.*, 1921, **19,** 216-25).—A theoretical discussion of these orientations, mainly on the basis of facts brought out by clinical observations. A similarity in mode of production is indicated. An abstract would be of little use.—W. M. B.

CENTRAL NERVOUS SYSTEM

2504. Zur Kenntnis der chemischen Zusammensetzung des Gehirns. T. Shimizu (*Biochem. Zeit.*, 1921, **117,** 252-62).—From 35 kg. of ox-brain, fractions of a gm. of most of the amino-acids were isolated, together with purine and pyrimidine bases and choline. Non-nitrogenous constituents identified were *d*-lactic acid, succinic acid, and inositol. —H. K.

2505. The " Moral Centre " in the Brain. W. Browning (*Med. Record*, New York, 1921, **99,** 1043-8, 1089-93).—The clinical evidence for this feat in cerebral localisation must be read in the original. The author states that the " moral centre " is limited in extent, and is situated in the right frontal lobe in right-handed people, in the left frontal lobe in left-handed people.—W. D. H.

2506. The Vascularity of the Cerebral Cortex of the Albino Rat. E. H. Craigie (*J. Comp. Neurol.*, 1921, **33,** No. 3).—The vascularity of the 5 laminæ in a single cortical region is similar in all the areas of the cortex examined, the lamina granularis interna (IV.) being the richest in every case. The supragranular layers show a tendency to be a little richer than the infragranular ones, the poorest layer being the lamina multiformis (VI.). It seems probable that the granular and supragranular layers are receptive and associative in function, while the infragranular layers give rise to corticofugal fibres. This suggests a comparison with the lower centres, where the sensory and

correlation nuclei were previously found to be more vascular than the motor nuclei. The average vascularity of the 5 layers is the same in the occipital and temporal areas, and is only slightly less in the precentral region. The parietal area is distinctly richer than the others, while the insular cortex is much the poorest. The vascularity of the 5 laminæ in the insular cortex covers about the same range as that of the various motor centres studied in the brain stem and spinal cord, while the vascularity of the other areas corresponds approximately to that of the sensory and correlation nuclei. The vascularity of the cerebellar cortex is of about the same order of magnitude as that of the cerebral cortex. Sexual and racial differences appear to be more marked in the cortex than in the parts of the central nervous system previously studied. The insular area seems to differ from the other areas in some way much more than they do from each other.—W. D. H. (*W. I.*).

2507. Growth of the Nerve Cells in the Superior Cervical Sympathetic Ganglion of the Albino Rat from Birth to Maturity. C. Ping (*J. Comp. Neurol.*, 1921, **33**, No. 3).—The largest nerve cells show a rapid growth during the first 25 days after birth, followed by slower growth. After puberty there is a tendency for the female to have larger cells than the male. The growth of these cells is more closely related to age than to body-weight. A few advanced cells are present at birth; their number increases slowly before the 15th day, but after that more rapidly. Correlated with this is a decrease in number of small cells which are transformed into large cells. These small cells seem to transform in larger numbers in the female during the later ages. At maturity the large cells may be classified in 3 groups according to the distribution of their Nissl bodies. There are a few binuclear cells at all ages, and after puberty some pigmented cells are found. Inbred albinos show absolutely smaller cells; only a slight sex difference in cell size and a smaller nucleus-plasma ratio. For this difference between the two strains of albinos no explanation is given.—W. D. H. (*W. I.*).

2508. Über experimentelle beim Versuchstier infolge afferenter Reize erzeugte Epilepsie. G. Amantea (*Pflüger's Arch.*, 1921, **188**, 287-97).—About 25% of normal dogs exhibit a hyperexcitability of the motor cortex to unipolar stimuli, and in these (but not in normal) dogs typical epileptic seizures may be produced by stimulation of the skin when the sensori-motor cortex of the corresponding area of the cerebrum has been rendered still more excitable by local application of 1% strychnine. The attack commences in those muscles the motor centres of which have been treated with strychnine. After strictly local cauterisation of the treated centres, stimulation of the reflexogenous skin zone is ineffective. Stimulation of these before application of strychnine to the centre is also ineffectual.—C. L. E.

2509. The Relation of the Hind-Brain to Micturition. F. J. F. Barrington (*Brain*, 1921, **44**, 23-53).—I. After transection of cord or bulb as far forward as mid-pontine level the bladder (cat) relaxes; forward of that transection does not produce relaxation. A tonic influence is exerted on the bladder from the mid-pontine level via finally the pelvic nerves. II. Reflex micturition—*i.e.*, the complete evacuation of the bladder as a reaction to gradual distension—requires some "centre" situate between calamus scriptorius and mid-brain and its spinal and peripheral nerve paths to and from the bladder. III. Reflex constituents of micturition. (1) Distension of the bladder provokes vesical contraction, the stimulus being not the volume *per se*, but the intravesical pressure produced by the volume. The pressure threshold varies from individual to individual, but not in the individual experiment. The afferent and efferent paths are in the pelvic nerves, the "centre" is at mid-pontine level; intravesical cocainising temporarily annuls the reflex. (2) Running fluid through the urethra excites contraction of the bladder. This reflex is likewise through the pelvic nerves, but has a subsidiary path in the pudic. The centre is likewise of mid-pontine level. (3) Distension

of the posterior part of urethra excites vesical contraction, relatively weak; the reflex path is via hypogastric nerve; the centre is spinal, behind posterior thoracic level. (4) Passage of fluid through the urethra excites reflex relaxation of the urethra itself. The reflex path is in the pudic nerves; low thoracic spinal section does not abolish the reaction. (5) Intravesical distension producing bladder contraction provokes also urethral relaxation; the efferent path is the pudic nerve. These reflexes presumably co-operate as chain reflexes; probably (1) is primary to (5); (2) ensures that reflex micturition shall not lapse on lapse of the stimulus for (1) before complete evacuation of the bladder. Full experimental procedure and details are supplied throughout.—C. S. S.

2510. The Place and Power of the Cerebellum. D. F. Harris (*Discovery*, 1921, **2**, 160-2).—A popular account of the physiology of this organ.—J. A. H.

SPECIAL SENSES

2511. A Quantum Theory of Colour Vision. J. Joly (*Proc. Roy. Soc.*, 1921, **92B**, 219-32).—The sensation of light is stimulated by the action of photo-electrons set free in the retina. The energy of the photo-electron is proportional to the frequency of the light; therefore the strength of the stimulus produced is the origin of colour sensations. Difference of wave-length or frequency alone distinguishes different parts of the spectrum. Natural objects absorb some waves and reflect others, hence they appear in different colours; the evolutionary development of 3 primary colour sensations (white)—red, green, and blue—is in accordance with the colours most frequently experienced, and colour itself is entirely a cerebral phenomenon. Accepting the "all or none" law and the existence of a refractory period, the retinal structure is in accord with this view. Colour vision depends on the cones alone, and the cone fibres are stouter than the rod fibres. The cone fibre itself consists of many fibrils, and the number of these activated depends on the kinetic energy of the photo-electron. The rod fibre is single, and a one-fibre stimulus (achromatic) is all it can transmit. To meet the theory it is assumed that a cone fibre consists of 9 fibrils; excitation of 2 causes red, of 3 green, of 4 blue. Colour blindness is due to diminution of the normal number, 9. The unit light stimulus discharged by a single fibril is termed a photon (ϕ). The basis of colour vision may then be stated: (*a*) the number of spectral quanta converted to electronic energy is controlled by the light absorption and bleaching of the visual purple; (*b*) the quanta increasing in energy from the long to the short wave-lengths stimulate 2, 3, or 4-cone fibrils, according to their energy; (*c*) the unit of luminous stimulus, the nerve discharge of 1 fibril, is not accompanied by colour. White is a sensation due to activation of all 9 fibrils. A highly dilute visual purple suffices. The fact that dark adaptation of the fovea is feeble supports this view.—W. D. H.

2512. The Effect of Red Fatigue on the White Equation. F. W. Edridge-Green (*Proc. Roy. Soc.*, 1921, **92B**, 232-4).—A white equation is formed by means of a mixture of a red of λ6670-6770 A°, a green of λ5144-5156 A°, and a violet of λ4250-4267 A°, matching a simple white. When the eye is fatigued with light viewed through a red glass which transmits from $\lambda 630\mu\mu$ to the end of the red end of the spectrum, or with pure spectral light in the region of $\lambda 670\mu\mu$, and the equation is again made, the amount of green is about half that required for the equation made with the unfatigued eye. The white equation and its match cannot be due to similar physiological processes, or both would change in the same ratio. When the fatiguing light is in the region of $\lambda 780\mu\mu$, no difference is seen between the mixed and simple white.—*Author's Abstract.*

2513. The Photochemistry of the Sensitivity of Animals to Light. S. Hecht (*Science*, 1921, **53,** 347-52).—The subject has already been dealt with in many previous papers, for which see Index, Vol. V. The present paper contains nothing new.—W. M. B.

2514. Über Lichtempfindlichkeit und Adaptierung des Vogelauges. H. Honigmann (*Pflüger's Arch.*, 1921, **189,** 1-72).—The light sensibility of fowls was studied by finding at what illumination grains of rice became visible, the sensitiveness being taken as the reciprocal of the intensity of illumination. To young, light-adapted birds red appears more luminous (for 660$\mu\mu$, 4 times more) than to equally light-adapted men. The sensitiveness to light of short wave-length is less in birds than in man; this is owing to the red oil globules in the bird's retina, and as the bird becomes older and these globules develop, the sensitiveness to short wave-length becomes still less. During dark adaptation, the sensitiveness to all wave-lengths increases uniformly for the first 15 mins.; for a time thereafter the sensitiveness to short wave-lengths increases so much more rapidly than that to longer waves that the normal relationship is reversed ("absolute" Purkinje phenomenon). This is because (in fowl much later than in man) a new sensory complex, =rod+visual purple, comes into play. The late entry of the rod apparatus, due to their relatively small number, enables the increase of sensitiveness of the cones to be separately studied, and it is thus found that the sensitiveness remains maximal for light of a given wave-length during the entire dark adaptation. In equally dark-adapted men and fowls the change of luminosity value of the same wave-length is not only relative, but also absolute. Thus, for 620$\mu\mu$ the light-adapted fowl is more sensitive than the man, whereas after 40 mins. dark adaptation the man is the more sensitive. The demonstration of a (relatively) inverted Purkinje phenomenon in dark-adapted birds shows that the site of primary stimulation by light is in the outer segments of the rods.—C. L. E.

2515. De l'importance de la phase périphérique dans la marge de variation des temps de latence sensorielle en fonction des intensités excitatrices. H. Piéron (*Compt. rend.*, 1921, **172,** 1612-4).—W. D. H.

2516. Les effets du chromatisme de l'œil dans la vision. A. Polack (*Compt. rend.*, 1921, **172,** 1532-4).—The state of refraction of the eye has a great influence on colour vision; for example, if the eye is made slightly myopic by glasses, and small coloured areas are viewed on a black ground, red appears more saturated, yellow more orange, green more yellowish, and blue more violet. If the eye is made hypermetropic, changes of an opposite direction are seen. On coloured backgrounds the problem is more complex. The reason is that the human eye is far from being achromatic; the different focussing of marginal and central rays is exaggerated by errors of refraction; dilatation of the pupil further accentuates the error.—W. D. H.

2517. Orientation of the Ear Vesicle in Amphibian Larvæ. C. Ogawa (*J. Exp. Zool.*, 1921, **34,** No. 1).—The ear vesicles of amphibia rotate back into normal position after they have been inverted (Streeter). This can occur in a stage in which differentiation of the vesicle has not yet taken place. The ear vesicle is transplantable from Rana to Amblystoma. Rotation occurs also in the ear vesicle, transplanted in inverted position from Rana to Amblystoma, and *vice versa*. Rotation back sometimes does not occur, probably on account of fusion of the skin and the vesicle. It is difficult to assume as cause of rotation any other factor than chemotaxis interacting between the vesicle and environment.—W. D. H. (*W. I.*).

2518. Function of Otoliths. F. H. Quix (*Ned. T. v. Gen.*, 1921, **65,** 2670).—A summary of investigations which will be published more fully later. The otolith apparatus works in a well-defined system of co-ordinates, as the semicircular canals do. The latter form a kinetic organ of sense; they provoke reflexes during movement, and enable an animal to perceive movement. The former is a static

organ of sense; it provokes reflex changes of tone in different groups of muscles when the position of the head is changed. The otolith system is active in 2 planes of co-ordination. The otoliths of the utricles provoke reflexes which are obtained by moving the head in the sagittal plane (rotation round a bitemporal axis), while the reflexes which appear when the head is moved in the frontal plane (rotation round the occipito-oral axis) are provoked by the otoliths of the saccules. The former are synergistic; one of them has the function of both, but acts quantitatively only with half the power of the 2, while the latter are antagonists; the loss of one leads to an asymmetric distribution of tone in both halves of the body, and in this way to asymmetric positions. The author shows that for the otolith system there is also a "macula lutea" and a "blind spot."—R. B.

2519. Le sens du goût a-t-il un coefficient de temperature. K. Komuro (*Arch. néerl. de physiol.*, 1921, **5,** 572-9).—The lower limit of taste with acid, salt, sugar, and quinine was examined, and the results presented in tables. There is a temperature coefficient, for the sensitiveness of the reaction increases by about 100% between 10° and 20° C. With further elevation of temperature this disappears, and the converse may even occur between 30° and 40°. Any hypothesis that taste is purely chemical therefore falls; a physico-chemical or colloido-chemical basis for the sense is suggested.—W. D. H.

2520. Essai d'olfaction physiologique. A. Heyninx (Thesis, Brussels, 1919). **The Riddle of Olfaction.** D. McKenzie (*J. Laryngol. and Otol.*, June, 1921, 288-96).—The thesis mentioned is only known to me by the second paper mentioned above, which is a critical but not wholly antagonistic account of it. It is a theory of the olfactory sense, which seeks to replace the many chemical theories by a physical one. McKenzie speaks of it as the finishing touch to Zwaardemaker's work. The new view briefly is that smell is due to vibrations in the ultra-violet region of the spectrum. In support of this the author states that odours (I take this to mean the gaseous particles which give rise to odour) absorb ultra-violet rays. He adds to the theory the suggestion that the quality of odours may be due to the addition of harmonics. He further points out the existence of pigment granules in both retinal and olfactory epithelium, and states that their size is equal to that of the wave-lengths of the undulations each receives. Tyndall 40 years ago stated that odorous vapours absorb the infra-red rays. This divergence is met by ingenious reasoning, instead of attempts to refute or confirm Tyndall by repeating his experiments. Other suggestions for renewed work made by McKenzie are: Do odorous vibrations undergo reflection and refraction as ultra-violet rays do ? Can they traverse a vacuum ? Are they obstructed by quartz which is not opaque to ultra-violet rays ? One wonders how long this theory will live.—W. D. H.

PSYCHOLOGY

2521. Über Widerstand und Potentialdifferenz bei dem psychogalvanischen Reflex. W. Einthoven and J. Roos (*Pflüger's Arch.*, 1921, **189,** 126-36).—The string galvanometer can be used to demonstrate the reflex, the physical causes underlying which are twofold, the one a change of potential, the other a change of resistance and polarisation, the 2 last always altering together in the same direction. In some persons the resistance-polarisation factor is lacking, while the E.M.F. effect is considerable; presumably the 2 effects are situated in different organs. Alteration of blood-supply is not the immediate physical cause of the reflex.—C. L. E.

2522. Über Übung und Ermüdung—I., II. E. Gellhorn (*Pflüger's Arch.*, 1921, **189,** 144-73, 174-80).—I. By psychological experiments it is shown that practice makes perfect, that different individuals vary in their fatigability and educability, etc.

II. Pulse-rate and body temperature are lowered in bodily or mental fatigue; in the latter the effect is most marked on the pulse-rate. Caffeine abolishes the subjective effect, but does not restore the pulse-rate. Since atropine increases the pulse-rate in fatigue, the author thinks that the fatigue heightens the vagal tone.—C. L. E.

2523. (1) Sur la relation entre divers mouvements de réaction volontaires. A. Querido. (2) **Quelques nouveaux points de vue concernant la psychologie des processus de réaction.** A. A. Grünbaum (*Arch. néerl. de physiol.*, 1921, **5,** 526-46, 547-62). —(1) A long description of apparatus for obtaining records of arm and finger movements precedes a discussion of results from the psychological point of view. The principal problem is the difference between a natural movement and those spoken of as conventional; the former suffers less when the attention varies, being of a more ancient biological type. It is a pity that physiologists and psychologists speak, write, and think in languages so different, for the former as a rule fail to grasp the meaning of the latter. (2) This is chiefly a commentary on Querido's work, and is still more psychological.—W. D. H.

2524. The Correlation between Motor Control and Rifle Shooting. R. A. Spaeth and G. C. Dunham (*Amer. J. Physiol.*, 1921, **56,** 249-56).—Steadiness, as tested by maintaining a needle in holes of various sizes without touching the sides, is definitely associated with marksmanship. The test can be rapidly carried out. The experiments, however, have, as yet, only been made on men of known ability.—W. M. B.

2525. Messende Untersuchungen über das scheinbare Gleichhoch, Geradevorne und Stirngleich. M. H. Fischer (*Pflüger's Arch.*, 1921, **188,** 161-240).—Unsuitable for abstraction.—C. L. E.

CEREBRO-SPINAL FLUID

2526. Cerebro-Spinal Fluid. VII. Effect of Adrenaline, Pituitrin, Pilocarpine, and Atropine. F. C. Becht and H. Gunnar (*Amer. J. Physiol.*, 1921, **56,** 231-40).—This series of papers is designed to prove that the flow of cerebro-spinal fluid is not due to secretion, but is influenced only by vascular pressure changes. A method is now described for recording the amount of fluid in the skull under slightly less than the normal pressure. Adrenaline and pituitrin do not increase fluid formation (confirmatory of Dixon and myself). The effects of pilocarpine and atropine are attributed to purely mechanical causes. (The effects Dixon and I found with 2 alkaloids were not clear, but puzzled us a good deal. It is possible that the mechanical effect is the correct explanation for these 2 drugs, though we should dispute the conclusion of Becht and his colleagues on the general question.)—W. D. H.

2527. Sur la pression du liquide céphalo-rachidien. J. A. Barré and R. Schrapf *Bull. méd.*, 1921, **35,** 63-5).—A pressure of cerebro-spinal fluid above 25 cms. in the lying posture or above 45 cms. in the sitting posture is abnormal. The pressure is very easily affected by variations in vascular and respiratory conditions. As much as 10 c.c. of fluid can be injected into a lumbar puncture without appreciable rise of pressure. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

2528. Permeability of the Meninges for Arsenicals. M. I. Smith and C. Voegtlin (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 342).—A heavy suspension of *Trypanosoma equiperdum* was injected into the subarachnoid space of rabbits, and this was followed by the intravenous injection of the arsenical. After 24 hours the cerebro-spinal fluid was examined for trypanosomes, and if none were found, it was assumed that the arsenical had obtained access to the cerebro-spinal fluid. By this method evidence was obtained that the normal meninges are permeable both to arsphenamine and neoarsphenamine, but there was great variation in results even when controllable conditions were apparently constant.—E. M.

BLOOD

2529. Blood-Volume—V. H. R. Arnold, E. B. Carrier, H. P. Smith, and G. H. Whipple. **VI.** F. W. Lee and G. H. Whipple. **VII.** H. P. Smith, H. R. Arnold, and G. H. Whipple (*Amer. J. Physiol.*, 1921, **56,** 313, 328, 336-60).—These papers deal at length with methods, and can only be understood if studied carefully in the original. V. This relates to the CO method; it is found to give a "reasonably accurate" measure of body hæmoglobin and hæmoglobin volume. VI. This deals with plasma volume as determined by haemoglobin injection, and this method also gives a "reasonably accurate" result. VII. This compares the dye method, the CO method, and a modified Welcker method. The dye method determines the plasma volume, and the other 2 the total Hb or red-cell volume. All the experiments were made on dogs, and the following figures are stated to give a correct average: Plasma, 4·8 c.c.+red cells 4·2 c.c.+white cells 0·2 c.c.=9·2 c.c. blood per 100 gm. body-weight.—W. D. H.

2530. Ist die Lebensform der roten Blutkörperchen bikonkav? O. Wyss (*Schweiz. med. Woch.*, 1920, **50,** 226-7).—The erythrocytes are not biconcave in circulating blood, but spherical or oval. The usual appearance is produced by changes taking place a few seconds after the blood is shed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2531. Zur Frage der Senkungsbeschleunigung der roten Blutkörperchen. J. Büscher (*Berlin. klin. Woch.*, 1921, **58,** 323-8).—A detailed account of the methods and results of Fahraeus, Linzenmeier, and other recent workers (see these abstracts during the last few months) is given. The importance of the subject is urged, its complex nature is commented on, whether it is due to the presence of a single specific substance is considered. The practical point which ends the paper is that sedimentation is accelerated in syphilis.—W. D. H.

2532. Beiträge zur Frage der Senkungsgeschwindigkeit der roten Blutkörperchen im menschlichen Blute. K. v. Oettingen (*Biochem. Zeit.*, 1921, **118,** 67-92).—The increased velocity of sedimentation of corpuscles in pregnancy is confirmed, but is not specific for pregnancy.—H. K.

2533. The Sizes of Red Blood-Cells in Emphysema. C. Price-Jones (*J. Path. and Bact.*, 1921, **24,** 326-32).—"The red blood-cells of patients suffering from emphysema are larger than those of healthy persons."—W. E. G.

2534. Zur Kenntnis der Chininhämolyse. A. Luger (*Biochem. Zeit.*, 1921, **117,** 145-52).—The author confirms the findings of Ruszynák that erythrocytes, treated first with quinine, show a diminished resistance to acids and an increased resistance towards alkalis. In the presence of saline such corpuscles show a diminished resistance to water, but increased resistance to saponin.—H. K.

2535. Über die Durchlässigkeit der menschlichen roten Blutkörperchen für Anionen. E. Wiechmann (*Pflüger's Arch.*, 1921, **189,** 109-25).—In blood, whether hirudinised, citrated, or defibinated, the ratio of Cl content of corpuscles and plasma (or serum) is 1 : 2·1, and this ratio tends to be maintained when corpuscles are suspended in isotonic NaCl solution; also when suspended in isotonic Na_2SO_4 there is a removal of Cl from the corpuscles. Under what are called uniform conditions—after 30 mins. passage of O_2 through the blood, and 2 hrs. stay of the corpuscular suspension in the ice-chest—human corpuscles show different permeability to different anions, as judged by the concentration of anion in corpuscle and menstruum: for SO_4'' 1 : 19·7 (very variable), PO_4''' 1 : 9·7, and for Br' 1 : 3·1. These relations apply both to citrated and to defibrinated blood. The permeability to PO_4'' is improved by rise of temperature, and that for Br' is lessened by Ca ions. Various dyestuff anions were not taken up by the corpuscles.—C. L. E.

2536. The Blood (and specially its Leucocytes) after Splenectomy. M. W. Hall (*Amer. J. Med. Sciences*, 1921, **160,** 72-9).—A case in man is dealt with. Removal of the spleen raised the total leucocytes; this lasted with irregularities for 3 months; some factor is removed which normally restricts white cell formation. Details of differential counts are given, but the greatest increase was in the cells of endothelial origin.—W. D. H.

2537. Fate of the Lymphocyte. C. H. Bunting and J. Huston (*J. Exp. Med.*, 1921, **33,** 593-600).—More lymphocytes enter the blood-stream from the thoracic duct during 24 hours than are present in the blood at any one time. The excess of cells migrate from the bloodvessels into the mucous membranes, chiefly the gastro-intestinal tract, and thence to the mucous surfaces.—W. E. G.

2538. La fonction antixénique des globulins. J. Roskam (*Compt. rend. soc. belge de biol.*, 1921, 269-71).—L'accolement des globulins aux particules étrangères en présence de plasma est un phénomène passif, indépendant de la vie de ces éléments. Ce fait se vérifie soit que l'on utilise une émulsion artificielle de globulins, tués par la chaleur, l'eau distillée ou le fluorure de sodium, soit que l'on emploie du plasma trouble chauffé à 48° à 50° C., pendant une heure et demie. (N.B.—Globulins=platelets.—W. D. H.)—E. Z.

2539. Zur Blutgerinnung nach Milz- und Leberbestrahlung. F. v. d. Hütten (*Münch. med. Woch.*, 1921, **68,** 846-8).—X-ray illumination of the spleen leads to an initial delay in the clotting time of blood, followed by a considerable diminution of the clotting time, which reaches a maximum in about 4 or 5 hours, and then disappears in 8 hours. Illumination of the liver produced this effect in only $\frac{1}{3}$rd of the cases.—J. H. B.

2540. Measurement of Coagulation Time. J. Geers (*Ned. T. v. Gen.*, 1921, **65,** 3051-6).—The author is the director of the "Friesch Volkssanatorium" at Joure. He examined the expectorated blood of his patients, and remarked that it was more liquid than normal, and bright red. If the bleeding was repeated, it became more and more viscous. Treatment with milk clysmas, which increases the capacity of clotting, had a good result. In order to measure the time necessary for clotting, the author uses a new method in which a drop of blood is pushed forward through a capillary lying horizontally. The driving force is obtained by a column of water in a vertical part of the capillary. He thus obtains a curve of the following drops of blood from one wound. The first drop needs a long time, about 120 to 150 secs. After the 2nd or 3rd there comes a horizontal line (till the drop clots in the wound itself). Before and after a milk clysma the clotting times were 150 and 70 secs. respectively.—R. B.

2541. Action du chloroforme sur le sérum inactif. R. Nolf (*Compt. rend. soc. belge de biol.*, 1921, 269-69; *Compt. rend. soc. biol.*, **85,** 268-9).—Le sérum de plasma de lapin conservé aseptiquement pendant quelques jours à 37°, perd toute sa thrombine et redevient anticoagulant en milieu oxalaté, presque à l'égal du plasma oxalaté de lapin. Agité avec du chloroforme en excès et mis à 37° pendant quelques heures, ce sérum acquiert à nouveau la propriété de coaguler le fibrinogène en milieu oxalaté.—E. Z.

2542. The Relation between the Blood Coagulating and the Smooth Muscle Contracting Properties of Tissue Extracts. C. A. Mills, G. Raap, and D. E. Jackson (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 341).—See Abstract No. 2288, Vol. VI., p. 332.—E. M.

2543. The Fate of Indian Ink injected into the Blood—I. K. Nagao (*J. Infect. Dis.*, Chicago, 1920, **27,** 527-38).—Free granules of ink are present in the blood for several hours after their injection. Ink granules are deposited in the endothelial cells of the liver, spleen, and marrow, and in the splenocytes. In the liver the granules are deposited in the endothelial cells of the blood-capillaries, the greatest number of granules in the cells near the central vein, the least in the capillaries at the periphery of the acini. In the spleen the granules are accumulated irregularly in the periphery of the Mal-

pighian bodies. After large injections osteoclasts and osteoblasts may take up granules. Some days after the injection granules appear regularly in the cardiac, hepato-duodenal, and jugular lymph nodes, which become quite black. After large injections granules appear in the liver cells and endocardial cells. Nucleated red cells appear in the blood after the injection of ink. The polymorphonuclear and mononuclear cells in the blood take up the granules. Eosinophile and mast cells, however, do not. Abnormal cells, possibly of endothelial origin, occur in the blood after the injection of ink.—W. D. H. (*Abstr. Bacteriol.*).

2544. The Distribution of Phosphoric Acid in the Blood of Normal Infants. G. M. McKellips, I. M. De Young, and W. R. Bloor (*J. Biol. Chem.*, 1921, **47,** 53-8).—The acid soluble, inorganic, lipoid, and organic phosphorus, was estimated in the plasma and corpuscles of the blood of infants, and the amounts contrasted with those in the blood of adults. The corpuscle values are much the same. The organic P in plasma is higher in infants, though the lipoid P is much lower.—H. E. R.

2545. Changes in the Blood of a Dog during Heavy Meat Feeding. H. V. Atkinson (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 329).—A dog was given lean beef heart (700 to 900 grams daily) for 7 days under certain conditions; an increase of 0·05% in the blood-fat was detected on the last day.—E. M.

2546. The Amount of Amino-Acids in Blood. K. de Snoo (*Dissertation Utrecht*, 1920, 130 pp.).—The author found by well-known methods that human blood contains on an average 6·8 mg. N due to amino-acids per 100 c.c. In horses' and cows' blood measurable amounts also occur. After a protein meal the amount was increased. The increase depends on the time after the meal. The absorption of amino-acid probably ceases after 6 hours. The amino-acid content of the urine was also increased after protein dietary (in 1 case from 10 to 44 mg. per 100 c.c.). In some cases of diabetes the author found no increase of amino-acids in the blood, nor did he find it in a case of cirrhosis. A slight increase was found in a case of jaundice. In a case of chronic nephritis the amino-N amount of the blood of patients with an empty stomach had risen somewhat; after N-free dietary the amount was the same as after mixed nutrition; a considerable percentage of the digested proteins is again excreted in the urine in the form of amino-acids. (Former short Abstract No. 1270, Vol. VI., p. 188).—R. B.

2547. Über den Aminosäurengehalt des Plasmas und der Blutkörperchen nach I. Bang. A. Costantino (*Biochem. Zeit.*, 1921, **117,** 140-4).—Polemical.—H. K.

2548. The Non-Protein Nitrogen of the Blood in Arterial Hypertension. J. L. Williams (*Arch. Int. Med.*, 1921, **27,** 748-54).—An examination of the blood of patients with unusually high blood-pressure in whom there was no evidence of renal disease. No connection between height of blood-pressure and amount of non-protein nitrogen in the blood was found.—J. H. B.

2549. Absorption of Calcium Salts in Man. E. H. Mason (*J. Biol. Chem.*, 1921, **47,** 3-4).—Absorption of Ca produces only a slight change in the Ca content of the plasma; if anything, $CaCl_2$ is absorbed better than Ca lactate.—H. E. R.

2550. Über Blutveränderung nach peroraler Kochsalzgabe. G. Samson (*Biochem. Zeit.*, 1921, **118,** 55-60).—Oral administration of salt is followed by increased salt content of the blood-serum, the major portion, however, passing into the tissues. There is also an increase of the protein content of the blood.—H. K.

2551. Schweissabsonderung und Blutzusammensetzung. E. Willbrand (*Biochem. Zeit.*, 1921, **118,** 61-6).—Heavy perspiration is followed by a thickening of the blood; parallel with this there is a loss of protein and sodium chloride from the serum. The residual (non-precipitable) nitrogen of the blood and the content of fat are unaltered. —H. K.

2552. Detection of Blood in Fæces. P. N. v. Eck (*Pharm. Weekblad*, 1921, **58**, 723-7).—It has been shown that a positive result with Adler's benzidine reaction does not necessarily denote the presence of blood. Evidence in confirmation of this conclusion is now adduced (compare Abstract No. 1428, Vol. V., p. 230).—W. D. H. (*J. C. Soc.*).

HEART

2553. The Law of the Heart. E. H. Starling (*Lancet*, 1921, ii., 212-3).—Abstract of a lecture at Royal Institution on a subject on which his book with the same title treats more fully (see review in these Abstracts, Vol. II., p. 716).—W. D. H.

2554. Das sogen. dritte Herzton. R. Ohm (*Berlin klin. Woch.*, 1921, **58**, 600-1).—The so-called third heart-sound occurs towards end of diastole, and is attributed to the right heart. Tracings of venous pulse with simultaneous galvanometer records of the heart-sounds are given, which support the view that the blood is standing in the right auricle; it cannot get into the ventricle, as the tricuspid valves are closed, and so produces a diastolic rebound (diast. Ruck).—W. D. H.

2555. Über die Einwirkung verminderten Luftdrucks auf das isolierte Froschherz. J. H. Hindmarsh (*Upsala Läkareförenings förhandlingar*, 1921, **26**, 25-6; Swedish).—By an improved technique it is shown that the effects of the diminished pressure are due mainly to oxygen lack, but the mechanical conditions are not without influence.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2556. Cardio-Inhibitor Centre. F. B. Becht (*J. Pharm. Expt. Ther.*, Proc., 1921, **17**, 336).—The effect on the heart of stimulation of the central end of the left vagus with the right vagus intact was studied on dogs under different anæsthetics. Under ether, reflex inhibition of the heart was only obtained in 40% of experiments, and in the remainder acceleration of the heart or no change resulted. When other drugs were used, inhibition of the heart always followed, but in some cases (*e.g.*, morphine, paraldehyde, and urethane) the inhibition was occasionally complete, a result never noted under normal conditions. It is therefore concluded that ether depresses the cardio-inhibitor centre, and that morphine, paraldehyde, and urethane stimulate it.—E. M.

2557. The Action of Magnesium Salts upon the Mammalian Heart. S. A. Matthews (*J. Pharm. Expt. Ther.*, Proc., 1921, **17**, 339).—The depressant action of $MgSO_4$ on the mammalian heart and the relation of this depression to the nervous and muscular mechanism are described.—E. M.

2558. Über die Ursache des Flimmerns einer Herzabteilung und der paroxysmalen Tachykardie. S. de Boer (*Deutsch. med. Woch.*, 1921, **47**, 742).—A brief note on theories. See the author's many previous papers.—W. D. H.

2559. Über die Bedeutung des Calciums für die Erregbarkeit der sympathischen Herznervenendigungen. R. Kolm and E. P. Pick (*Pflüger's Arch.*, 1921, **189**, 137-43).—In perfused frog hearts lacking Ca, adrenaline may cause diastolic arrest removable by atropine. Entire hearts previously treated with Ca show ventricular contracture on giving adrenaline; though the auricle continues to beat as before, it plays a part in the effect, since this contracture is not seen in an isolated ventricle. The adrenaline-Ca contracture is inhibited by ergotoxine, though the K-Ca contracture is not. In both the presence of the auricle is necessary, though sympathetic nerves are only involved in the former. (See also Abstracts No. 3561, Vol. V., p. 563, and Nos. 854 and 976, Vol. VI., pp. 131 and 147.)—C. L. E.

2560. Specific Action of Atropine in Relieving Certain Irregularities of Heart-Beat. L. F. Bishop (*J. Amer. Med. Assoc.*, 1921, **77**, 31-2).—A case of nodal ryhthm restored to normal (electrocardiogram).—C. L. E.

2561. Principles Underlying the Treatment of Heart Disease by Exercise. T. B. Barringer (*J. Amer. Med. Assoc.*, 1921, **77,** 7-10).—The principle of graduated exercises controlled by blood-pressure observations is outlined.—C. L. E.

2562. L'électrocardiogramme physiologique. H. Fredericq (*Arch. méd. belge*, 1921, **74,** 21-36, 98-113).—Oreillettes et ventricules se contractent normalement selon le type de la contracture musculaire. L'E.C.G. des oreillettes et des ventricules est physiologique. L'oscillation R est l'expression de l'activité des fibrilles musculaires, l'oscillation T l'expression de l'activité plus lente du sarcoplasme.—E. Z.

2563. Pour servir à l'interprétation de l'électrocardiogramme. I. Le trajet et la vitesse de l'onde d'excitation dans le ventricule de la tortue. II. La position de l'onde T dans la contraction alternante du cœur de la tortue. III. L'électrocardiogramme des cavités cardiaques isolées du cœur de la tortue. H. Fredericq (*Compt. rend. soc. biol.*, 1921, **85,** 239-43).—Experiments criticising the current views about the nature of the Q.R.S. complex and the T wave In the tortoise heart the author finds a constant time for the period R T in spite of alternating variations in the length of ventricular contraction. The T wave may be finished when muscular relaxation is just beginning. He thinks that the action current consists of at least two phases—a rapid one and a slower one.—J. H. B.

CIRCULATION

2564. The Circulation Time in Dogs and Rabbits, and its Relation to the Reaction Time of the Respiratory Centre to Sodium Cyanide. A. S. Loevenhart and B. H. Schlomovitz (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 345).—It is concluded that the reaction time of a given animal to sodium cyanide is approximately equal to the complete circulation time in that animal.—E. M.

2565. Über eine Methode zur genauen Bestimmung des gesamten Koronarkreislaufs. J. G. D. de Barenne (*Pflüger's Arch.*, 1921, **188,** 281-6).—The heart-lung preparation was modified by connecting the venous reservoir to the pulmonary artery, so that the right ventricle was empty except for the coronary flow, which could be measured. The observations of Starling and Evans, and of Markwalder and Starling were confirmed.—C. L. E.

2566. Influence of Various Circulatory Conditions on the Reaction to the Low Oxygen of Rebreathing. E. C. Schneider and Dorothy Truesdell (*Amer. J. Physiol.*, 1921, **56,** 241-8).—In their response to and compensation for low percentage of oxygen, there was found to be no difference between high and low systolic or diastolic pressures, rapid or slow pulse-rates, or of rise or fall of systolic pressures on standing. Conditions were chosen so that neither the heart nor the nervous system was subject to greater strain than in average conditions of the cases considered.—W. M. B.

2567. An Automatic Method for Serial Blood-Pressure Observation in Man. M. A. Blankenhorn (*J. Amer. Med. Assoc.*, 1921, **77,** 90-3).—Description, drawings, and specification of an ingenious apparatus suitable for clinical use. The cuff is automatically inflated hourly from a pressure tank and then deflated, the oscillograph record being written on smoked paper. The relation between the systolic and diastolic pressures deduced from the record and the readings obtained from the Korotkoff sounds are discussed.—C. L. E.

2568. Blood-Pressure Changes during Abdominal Operations. A. McGlannan (*J. Amer. Med. Assoc.*, 1921, **77,** 107-10).—By following the systolic pressure during operations much valuable information can be obtained—*e.g.*, as regards the advent of shock or the advisability of a multiple stage operation.—C. L. E.

2569. Contributo sperimentale alla fisiopatologia della pressione arteriosa del sangue. A. Marassini (*Arch. di Fisiol.*, 1920, **18**, 21-47).—Intravenous injections of 0·7% NaCl warmed to 38° C. is not sufficient to restore to the former level the blood-pressure lowered in dogs by means of a great and rapid abstraction of blood. However, the height reached by the blood-pressure in such conditions, though lower than normal, is sufficient to sustain life. If the blood-letting is repeated many times, and the blood-loss is each time compensated with an equal volume of 0·7% NaCl injected through the jugular vein, the average blood-pressure becomes lower each time. If after blood-letting, injections of physiological salt solution are made in such a quantity as to increase the total mass of the circulating fluid, the blood-pressure may temporarily reach very high levels, but soon descends to a level which is out of proportion to the quantity of injected fluid. In such cases life and a return to normal conditions is possible. The fluid injected for compensating a great loss of blood is generally eliminated from the circulation in much greater quantities. (The author is apparently unaware of Bayliss's work.)—C. d. F.

2570. Sur les variations de deuxième et de troisième ordre de la pression artérielle chez l'homme d'après l'oscillographie. A. Mougeot and P. Petit (*Compt. rend. soc. biol.*, 1921, **85**, 78-80).—The systolic pressure is nearly constant in physiological conditions in men. The diastolic pressure varies with the respiration; it rises from the beginning of inspiration, and falls from the beginning of expiration.. The rise is considered to be due to a rhythmic peripheral vaso-constriction.—J. H. B.

2571. Functional Blood-Pressure. R. F. Ives (*Amer. J. Med. Sciences*, 1921, **160**, 61-71).—In addition to organic changes, there are functional conditions which produce hyper- or hypotension. These are described and classified under the following causes: (1) Auto-intoxication from alimentary canal; (2) climacteric (which raises arterial pressure); (3) toxins associated with pregnancy and various diseases; (4) endocrine disturbances; this lends itself to much speculation.—W. D. H.

2572. Capillary Pressure and Shock. L. Hill and J. McQueen (*Lancet*, 1921, ii., 65-7).—The authors again describe their method for estimating capillary pressure; point out the need for a correct estimate; decry past methods, which gave results too high; and doubt what effect, if any, moderate variations of arterial pressure have on capillary pressure. They again point out that blood need not go through capillaries at all, and that short cuts by larger vessels connecting arteries to veins form a safety factor in conditions (shock) when the blood stagnates in capillaries.—W. D. H.

2573. Action hémodynamique de l'absorption et de la sécrétion qui s'exercent au niveau de la paroi des capillaires (étude fondée sur les expériences physiques). A. Hanak (*J. de physiol. et de pathol. gén.*, 1921, **19**, 187-97).—A discussion of the changes in the circulation brought about by absorption or filtration of fluid through the walls of the capillaries.—W. M. B.

RESPIRATION

2574. Modifications du volume respiratoire et de l'élimination carbonique par les anésthésiques et par les hypnotiques. C. Heymans (*Arch. internat. pharmacodyn. et thér.*, 1921, **85**, 493-527).—A determination of changes in the volume of respired air and in the volume of CO_2 expired in rabbits during and after anæsthesia. Ether and chloroform were administered intravenously. In surgical anæsthesia both the respiratory volume and the volume of expired CO_2 are diminished from 20 to 25%. Deep anæsthesia causes a diminution of both as great as 50%. Up to this limit the percentage of CO_2 in expired air does not rise. The author concludes that a diminution of

50%, being greater than that after curarisation, indicates a paralysing effect of the anæsthetic on the CO_2 production in peripheral organs.—J. H. B.

2575. Azione degli stimoli termici cutanei sulla temperatura dell' aria espirata. A. Azzi (*Lo sperimentale*, 1921, **75,** 49-61).—The author finds that the application of cold to a part of the skin lowers the temperature of expired air; the degree to which the temperature is lowered depends on the intensity of the stimulus. Similarly, the application of heat to an area of skin raises the temperature of the respired air. A vasodilatation of the vessels of the bronchi, pharynx, etc., seems to accompany a vasodilatation of cutaneous vessels.—E. P.

2576. Les échanges gazeux dans le canotage. M. N. J. Dirken (*Arch. néerl. de physiol.*, 1921, **5,** 467-525).—Much of the paper deals with the apparatus and methods used in the investigation of respiratory metabolism in rowers. The results do not appear to differ in any essential points from those obtained in other kinds of work by other researchers with which they are compared. The author purposely abstains from giving mean figures, because, although in all 4 subjects of his experiments the main effects (diminution of pulse frequency, increase of respiratory quotient, etc.) were alike, he wishes to draw special attention to individual differences, which naturally must be studied in the full paper. The human machine is the same in the gross, but there is individuality (physiological, psychological, etc.) as well.—W. D. H.

2577. Response of the Circulation to Low Oxygen Tension. IV. A Sphygmographic Study of the Pulse during the Rebreather Test. N. C. Gilbert and C. W. Greene (*Arch. Int. Med.*, 1921, **27,** 688-98).—Subjects breathed a continually diminishing percentage of oxygen, all CO_2 being absorbed. Records of the pulse were taken with the sphygmograph. As the oxygen percentage diminished, there was found to be a steady increase in pulse-rate until a point where oxygen want became acute, and marked acceleration of pulse-rate set in. Dicrotism was observed, but bore no relation to cardiac efficiency. Sinus arhythmia at first increased during the test, but later decreased. There was a tendency for premature ventricular contractions to increase, and later diminish. Pulsus *alternans* was very rarely observed.—J. H. B.

2578. Sur le " second souffle " des coureurs. P. Chailley-Bert, R. Faillie, and J. P. Langlois (*Compt. rend.*, 1921, **172,** 1610-1).—Second wind has been variously explained. Lagrange thought it due to an opening up of more pulmonary alveoli, others to a settling down to more effective regulation by the respiratory centre. Pembrey and Cooke (1908) noted a fall of the respiratory quotient, and a diminution of pulmonary ventilation. According to present authors, second wind is of brief duration owing to the accumulation of fatigue products, and during this time hyperactivity is succeeded by a fall both in ventilation and in metabolism. The result is, the subject is better adapted to the work, and his machinery is ameliorated. The muscles work more economically, and are more co-ordinated to the antagonistic muscles. The authors hope later to show that second wind coincides with a variation in H-ion concentration (see MacKeith and others, Abstract No. 2178, Vol. VI., p. 316).—W. D. H.

2579. Anoxæmia and Nervous Symptoms. F. M. R. Walshe (*Med. Sci., Abstr. and Rev.*, 1921, **4,** 427-34).—An excellent review which can be recommended to those interested in getting a connected account of previous work on the subject.—W. D. H.

ALIMENTARY CANAL

2580. Les co-ordinations fonctionnelles dans le tube digestif. E. Zunz (*Bull. soc. roy. sc. méd. nat. Bruxelles*, 1921, 55-78).—On sait aujourd'hui que pour assurer les coordinations fonctionnelles, l'organisme dispose de mécanismes de régulation nerveux

d'une part, chimiques ou humoraux d'autre part. Le tube digestif fournit une série remarquable de ces deux espèces de corrélations. Tels sont les rapports entre l'activité motrice de l'estomac à jeûn, la faim et l'appétit; la sécrétion des divers sucs digestifs et l'existence des substances excito-secrétoires directes ou indirectes dans les aliments; la production des mouvements intestinaux et la choline. L'auteur essaie d'établir une esquisse, quelque peu schématique, de ces interrelations fonctionnelles.—E. Z.

2581. Rôle of the Intrinsic Plexuses in determining the Effects on Gastric Motility of Vagus Stimulation. F. T. Rogers and Z. Bercovitz (*Amer. J. Physiol.*, 1921, **56,** 257-63).—The vagus may either excite motility or inhibit tone and contractions in both dog and turtle. Stimulation in the turtle is unable to induce prolonged contractions, owing to fatigue in the peripheral synapses, not to peculiarities of the muscle. Fall of temperature and asphyxia abolish contractile response by action on nerve plexuses rather than on muscle. The inhibitory effects are less susceptible to fatigue than the excitatory ones.—W. M.B.

2582. Die Atropinwirkung bei Störungen der Magenmotilität. P. Klee (*Verhandl. dtsch. Kongr. f. inn. Med.*, 1921, 155-7).—Atropine inhibits peristalsis in the stomach even when impulses in vagus and sympathetic are eliminated. The influence of atropine on the tone of the musculature of the stomach is dependent on an efficient sympathetic control.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2583. Analisi sperimentali sul meccanismo della ruminazione. G. B. Censi Mancia (*Riv. di biol.*, 1921, **3,** 58-67).—A discussion of the embryological development of the complex stomach of ruminants and of the effects of vagus stimulation on the several movements, together with an account of the results of feeding experiments with coloured straw and liquids.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2584. Estimation of Enzymatic Activities of Duodenal Contents of Normal Man. C. W. McClure, A. S. Wetmore, and L. Reynolds (*Arch. Int. Med.*, 1921, **27,** 706-15).—The proteolytic enzyme is estimated by measuring the non-protein nitrogen developed from casein, using Folin and Wu's method for the measurement. The amylase is determined by digestion of a starch-phosphate mixture. The sugar produced is estimated by the method of Folin and Wu for blood-sugar. Lipase is measured by the amount of acidity (titrated against decinormal NaOH) liberated from a standard cottonseed-oil emulsion. In all estimations a constant P_H is obtained by the use of phosphate mixtures.—J. H. B.

2585. Experiences with the Lyon Test (Magnesium Sulphate Lavage of the Duodenum). B. B. Crohn, J. Reiss, and M. J. Radin (*J. Amer. Med. Assoc.*, 1921, **76,** 1567-71).—The practical value of the test rests on the following ladder of hypotheses: (1) That there is a functional sphincter at the mouth of the common bile duct; (2) this is relaxed by a nervous mechanism, which also causes contraction of the gall-bladder; (3) that this happens when strong $MgSO_4$ solutions are applied to the duodenal mucosa, (4) and the fluid obtained in the duodenum is really gall-bladder fluid; (5) a cytological, bacteriological, and chemical examination of which gives important information regarding gall-bladder pathology. Investigation of 50 or 60 cases convinces the authors that there is much to be said for the method, though they have not found it to be reliable for the identification of chronic gall-bladder disease. In experiments on dogs, no evidence for (3) was obtained.—C. L. E.

2586. Phenoltetrachlorphthalein Estimation in the Duodenal Contents. M. Kahn (*J. Amer. Med. Assoc.*, 1921, **77,** 41).—In order to study Lyon's method of stimulating bile flow, 8 c.c. of phenoltetrachlorphthalein were injected intravenously, and at the same time 25 c.c. of saturated $MgSO_4$ solution were introduced into the duodenum by an Einhorn tube. The dye was sought for in the duodenal contents every 10 mins. It was concluded that the $MgSO_4$ stimulates the flow of bile by relaxing the sphincter, but apparently it is not gall-bladder, but liver bile that flows.—C. L. E.

2587. The Concentrating Activity of the Gall-Bladder. P. Rous and P. D. McMaster (*J. Exp. Med.*, 1921, **34,** 47-73).—The bile from different portions of the liver is of similar pigment content. By comparing the pigment strength of bile from a duct branch and from the bladder, it was found that the secretion is concentrated from 6 to 10 times in the 24 hours. Merely in a passage through the gall-bladder the concentration is from 2 to 5 times, which indicates a potential source of error in observations upon samples obtained from a fistulous channel of which the bladder forms a part. The bile ducts do not concentrate, but slightly dilute the secretion they convey.—C. L. E.

2588. Physiological Causes for the Varied Character of Stasis Bile. P. Rous and P. D. McMaster (*J. Exp. Med.*, 1921, **34,** 75-95).—While the gall-bladder concentrates bile and adds mucus to it, the ducts dilute the bile with a thin colourless secretion of their own, which is always free from cholates and nearly free from cholesterol; it may easily be collected from isolated duct segments, and can be formed against considerable pressure. The fluid so collecting in an obstructed duct connected with a pathological non-concentrating gall-bladder gradually replaces the original pent-up bile, and represents the "white bile" of the surgeons. If the gall-bladder remains normal the stasis fluid is different, consisting at first of inspissated bile and mucus, and later of duct secretion which has replaced the former tarry accumulation. The inspissation of bile is in these cases greatest after 1 or 2 days. The concentrating activity of the gall-bladder has probably much to do with the formation of calculi, and since intermittent stasis is a predisposing cause of cholelithiasis, this should be avoided by frequent feeding in those with a tendency to gall-stones.—C. L. E.

2589. Über das Schicksal einiger Polysaccharide im Verdauungskanal bei Säugetieren. T. Shimizu (*Biochem. Zeit.*, 1921, **117,** 227-40).—Fæcal constituents are able to convert inulin, lichenin, and hemicellulose into acetic, propionic, and butyric acids. Lactic acid also appears. The agent is probably bacterial as pure cultures—*e.g.*, *B. coli*, *lactis*, *proteus*, and *subtilis* have the same power.—H. K.

2590. Über die Spaltung von einigen Polysacchariden (Inulin, Lichenin und Hemicellulose) im Verdauungskanal bei Säugetieren. T. Shimizu (*Biochem. Zeit.*, 1921, **117,** 241-4).—Macerated gut or pancreas, separately or combined, failed to liquefy or produce reducing sugars from the polysaccharides named.—H. K.

FOODS AND VITAMINS

2591. Quality of Protein in Nutrition. R. H. A. Plimmer (*Nature*, 1921, **107,** 664-8).—Deals chiefly with the importance of individual amino-acids in nutrition and the maintenance of health.—C. L. E.

2592. Supplementary Protein Values in Foods. I. The Nutritive Properties of Animal Tissues. II. Supplementary Dietary Relations between Animal Tissue and Cereal and Legume Seeds. III. Supplementary Dietary Relations between the Proteins of the Cereal Grains and the Potato. IV. The Supplementary Relations of Cereal Grain with Cereal Grain; Legume Seed with Legume Seed; and Cereal Grain with Legume Seed. V. Supplementary Relations of the Proteins of Milk for those of Cereals and of Legume Seeds. E. V. McCollum, N. Simmonds, and H. T. Parsons (*J. Biol. Chem.*, 1921, **47,** 111, 139, 175, 207, 235-47).—A mass of experimental material which should be read in the original, and is unsuitable for fully abstracting. The protein of the kidney, liver, and muscle of the ox appear to possess about the same biological value as those of the wheat kernel, and dietaries high in protein content (35 to 70 % of diet) were well tolerated. The animal tissues mentioned are deficient in calcium and sodium chloride. The meat

proteins are good supplements for the proteins of cereals, and the glandular organs serve as good sources of vitamin A. The nitrogenous compounds of the potato also have value in enhancing the biological worth of the proteins of cereals and legumes. The latter proteins are inferior to most of the other types investigated, and do not raise the biological value when mixed with seeds. The milk proteins are apparently inferior to animal tissues such as liver, kidney, and muscle in supplementing the value of cereals, legumes, and potatoes, but milk itself is especially valuable in making good deficiencies of calcium and vitamin A.—J. C. D.

2593. Mineral Requirements in Animal Foods. A. T. Peters (*Vet. Med.*, Chicago, 1921, **16,** 27-8).—The need of animals for proper mineral matter is urgent. The author writes from farm experience.—W. D. H. (*Abstr. Bacteriol.*).

2594. Les extraits alcooliques de levure de bière dans la polynévrite aviaire. H. Penau and H. Simonnet (*Compt. rend. soc. biol.*, 1921, **85,** 198-200).—To keep pigeons in a good state of nutrition for at least 8 months, it is only necessary to add to a synthetic diet deficient in factor B a quantity of alcoholic extract of dry yeast equal to $\frac{1}{500}$ of the dry weight of the diet.—J. H. B.

2595. Über die functionellen Eigenschaften der Vitamine. E. Bürgi (*Deutsch. med. Woch.*, 1921, **47,** 613-6).—The importance of admitting vitamins to the pharmacopœia is urged. Experiments on rabbits are described in which opium, etc., was given in conjunction with vitamins. Vitamins are believed to act as specific stimulants to parasympathetic nerves, respiratory centre, etc. They affect the heart unfavourably. (How the author prepared his vitamins he omits to say. When their composition is known, and they are prepared pure, the time will arrive for a study of their pharmacology. He used a commercial preparation of vitamin B.)—W. D. H.

2596. La résistance du lapin a l'avitaminose. J. Lopez-Lomba and P. Portier (*Compt. rend.*, 1921, **172,** 1682-4).—Portier and Randoin (Abstract No. 594, Vol. V., p. 92) described what they termed creation of vitamins from bacteria if rabbits are allowed to eat their fæces. They still believe that vitamins can arise from bacteria, but find that adult rabbits resist for an indefinite time nutriment sterilised at a high temperature; the bacteria which form the source of vitamin are those normally present in lymphoid tissue in the appendix and elsewhere. The growing rabbit is different; this source of vitamin is insufficient for life.—W. D. H.

2597. The Effect on the Guinea-Pig of Deprivation of Vitamins. F. M. Tozer (*J. Path. and Bact.*, 1921, **24,** 306-25).—The deprivation of fat-soluble A vitamin leads to changes in bone tissue which may be indistinguishable from the effects of scurvy. Symptoms of scurvy and the symptoms caused by absence of fat-soluble A are discussed and contrasted, and the morbid anatomy and histopathology of each condition are described.—W. E. G.

2598. Fat-Soluble Vitamin. VII. The Fat-Soluble Vitamin and Yellow Pigmentation in Animal Fats: Its Stability to Saponification. H. Steenbock, M. T. Sell, and M. V. Buell (*J. Biol. Chem.*, 1921, **47,** 89-109).—An examination of cod-liver oil, butter fats, and beef fats confirm the recent observations of Drummond and Coward (Abstract No. 2976, Vol. V., p. 474), who showed that the amount of vitamin A is not proportional to the amount of lipochrome pigments present. The value of some samples of beef fat may be higher than many specimens of butter fat. On the other hand, butters or beef fats deeply pigmented with natural pigments are usually rich in vitamin A. The vitamin withstands saponification by drastic methods, and would appear to be neither an ester nor a fat.—J. C. D.

2599. Vitamine (Biokatalysatoren) B und Co-Enzyme—II. H. v. Euler and K. Myrbäck (*Zeit. physiol. Chem.*, 1921, **115,** 155-69).—The following nomenclature is suggested: Vitamin A (fat sol.), antirachitic; vitamin B (water sol.), antineuritic; biocata

lysts B (water sol.), this group being divided into biocatalyst B I. (growth promoting), biocatalyst B II. (accelerating fermentation), biocatalyst B III. (Harden's co-enzyme, accelerating fermentation). A method for determining the biocatalysts B quantitatively by their influence on the rate of fermentation of glucose is described. It is shown that the addition of extracts containing the biocatalysts results first in an increase of the rate of fermentation to a maximum, after which further amounts depress the velocity of the reaction. Preliminary experiments on the balance of biocatalyst B II. in the animal body are reported.—H. W. D.

2600. Une critique berlinoise du " bios." M. Ide (*Compt. rend. soc. belge de biol.*, 1921, 253-4).—L'auteur démontre que les critiques de Naumann et de Lindner ne renversent aucunement les résultats expérimentaux obtenus en 1900 par Wildiers, confirmés et étendus par Devloo et d'autres chercheurs. Le bios est si pas identique, du moins inséparable de la vitamine antibéribérique.—E. Z.

2601. La notion du bios. P. Biourge (*Compt. rend. soc. belge de biol.*, 1921, 254-6).—D'après Lindner, si les cellules de levure ne se multiplient pas dans les expériences de Wildiers, c'est parce que, en présence de sels ammoniacaux et de beaucoup d'air, elles subissent une dégénérescence graisseuse. L'auteur démontre qu'il n'en n'est rien et établit, par de nouvelles expériences, que la notion du " bios " doit être conservée et prend une valeur de plus en plus considérable.—E. Z.

METABOLISM

2602. Échanges nutritifs des animaux en fonction du poids corporel. L. Lapicque (*Compt. rend.*, 1921, **172,** 1526-9).—The law of surface area in regard to metabolism does not hold good, as Richet pointed out for large animals like oxen, and small ones like goldfinches. The present paper seeks to interpret divergencies, and the author presents results in curves; variations are mainly a function of temperature; changes in external temperature are specially potent in influencing the metabolism of small animals.—W. D. H.

2603. Über die energetische Flächenregel. M. Pfaundler (*Pflüger's Arch.*, 1921, **188,** 273-80).—A review of some opinions concerning the relation between energy exchange and body-weight (and surface). If surface is a determining factor, it must be a sum of the surfaces of all the elements taking part in the metabolic process.—C. L. E.

2604. Basal Metabolism of Normal Women. K. Blunt and M. Dye (*J. Biol. Chem.*, 1921, **47,** 69-87).—A series of 216 observations on 17 women gave results which indicate that there is no definite change in the basal metabolism during menstruation. A wide range of daily variation was observed, but the average figures are lower than that calculated from the Benedict or Du Bois standards. There was no relation between minimum pulse-rate and basal metabolism in the subjects, nor any definite constant change in the rate during menstruation.—J. C. D.

2605. Über den Stoff- und Energieumsatz junger Ferkel auf Grund von Fütterungsversuchen, verbunden mit der Zerlegung ganzer Ferkelkörper. O. Wellmann (*Biochem. Zeit.*, 1921, **117,** 119-39).—Experiments on sucking pigs to determine the source and amount of energy used in putting on flesh. The author considers that protein does not furnish the energy for the work of assimilation.—J. H. B.

2606. Über den Einfluss des Lebensraumes auf das Wachstum der Kaulquappen. F. Bilski (*Pflüger's Arch.*, 1921, **188,** 254-72).—The larger the volume of water per individual the more rapid the growth; better results were obtained by reducing the number of tadpoles in a given vessel than by increasing the volume of water. Too

frequent renewal of the water reduced the rate of growth. The results are discussed on mathematical lines, but their practical bearing is clear.—C. L. E.

2607. Nucleinstoffwechsel. XIII. Zur Frage der intermediären Urikolyse beim Menschen. S. J. Tannhauser and H. Schaber (*Zeit. physiol. Chem.*, 1921, **115**, 170-9).—Experiments are given in support of the author's view that uric acid is the end product of purine metabolism in man; 5 individuals with healthy kidneys were injected with guanosine and with adenosine. In 4 cases practically quantitative excretion of uric acid followed. In the 5th case only about ½ of the theoretical amount of uric acid appeared in the urine after injection of adenosine, and still less after guanosine; even uric acid itself, injected as the sodium salt, was recovered only to the extent of 62%. It transpired that this abnormal individual came from a family afflicted with gout.—H. W. D.

2608. Über das Schicksal parenteralverabreichten Schwefels und seinen Einfluss auf den Stoffwechsel. R. Meyer-Bisch and E. Basch (*Biochem. Zeit.*, 1921, **118**, 39-49).—Intramuscular injection of sulphur in oil is followed by increased protein breakdown, shown by increased N and S output in the urine, the proportion of the latter element being greater than that administered.—H. K.

2609. Bahnung im intermediären Zuckerstoffwechsel. H. Staub (*Biochem. Zeit.*, 1921, **118**, 93-102).—There is a diminished capacity for assimilating the first dose of glucose in fasting persons, or after a fat and protein diet, and also after hard work. In a fasting person the assimilation increases to a maximum after 10 hours, and then falls off after 15 or more hours. The author, to explain these and other results, postulates "equilibrating ferments" (Gleichgewichtsfermente) produced in the blood by foodstuffs to restore to equilibrium the sudden abnormal conditions produced by a high concentration of the food administered.—H. K.

2610. Formation and Excretion of Hippuric Acid in Man. I. Snapper (*Ned. T. v. Gen.*, 1920, **65**, 3044).—Glycine is always present in the body in considerable amount. In the disintegration of proteins in the intestine phenylalanine is always formed, which changes easily into benzoic acid. This explains the presence of hippuric acid in the urine of persons on a milk dietary (without benzoic acid), as it was found up to 300 mgr. daily. The author has investigated the amount of hippuric acid in the urine of normal persons (only fed with milk and porridge) and patients of different diseases, and came to the following results: In normal and sick men with normal kidneys 5 gm. sodium benzoate was within 12 hours nearly totally excreted in the form of hippuric acid. Healthy kidneys are able to excrete urine in which the amount of hippuric acid may rise to 2%. The N of the hippuric acid may form a considerable part of the total nitrogen of the urine, far more than the theoretically calculated 5%, assuming that the glycine is, on the average, 4% of the body proteins. In patients with typical pneumonia and chlorine retention, or with complete obstruction of the bile duct, or with a complete bile fistula, 5 gm. sodium benzoate are within 12 hours excreted nearly completely in the form of hippuric acid. From the latter two groups of cases it follows that the glycine depot of the body is not dependent on the bile secretion.—R. B.

2611. Verhalten des Pyrrols im Tierkörper. T. Shimizu (*Biochem. Zeit.*, 1921, **117**, 266-8).—Injection of an aqueous suspension of pyrrol into dogs is followed by its elimination in the urine as methylpyridine.—H. K.

2612. Verhalten des Phrenosins im Tierkörper. T. Shimizu (*Biochem. Zeit.*, 1921, **117**, 263-5).—Phrenosin given to a dog appeared in the urine as sphingosine; the latter when given by mouth, or injected subcutaneously into dogs or rabbits, appeared unchanged.—H. K.

2613. Über den Einfluss einiger Polysaccharide (Inulin, Lichenin und Hemicellulose) auf den Eiweissumsatz. T. Shimizu (*Biochem. Zeit.*, 1921, **117**, 245-51).—Feeding

experiments on dogs show that the polysaccharides named have a protein-sparing action.—H. K.

2614. Creatinuria. II. Arginine and Cystine as Precursors of Creatine. III. The Effect of Thyroid Feeding upon Creatinuria. E. G. Gross and H. Steenbock (*J. Biol. Chem.*, 1921, **47,** 33-43, 45-52).—Arginine and casein administered to pigs augment creatinuria. Cystine increases the output of creatine only when the acidity due to the oxidation of its sulphur is left unneutralised. Thyroid administration stimulates creatine formation. Creatinuia may depend upon a balance between the action of arginase and of oxidation on arginine.—H. E. R.

2615. Über Cholesterinstoffwechsel beim Säugling. L. Wacker and K. F. Beck (*Berlin. klin. Woch.*, 1921, **58,** 453-7).—Cholesterol is important in growth; it occurs in all cells. It comes from the food, especially fatty, yellow foods; it is not over-abundant in milk. Its disordered metabolism runs parallel to that of fat and of Ca, and where a negative cholesterol balance occurs it should be given by the mouth. Resistance against infection is thereby heightened.—W. D. H.

2616. Recherches sur la rétention lactée. Relation entre le lactose résorbé au niveau de la mamelle et le lactose urinaire. C. Porcher and A. Tapernoux (*Compt. rend. soc. biol.*, 1921, **85,** 101-3).—Lactose injected into the resting udder of a goat was not all excreted in the urine. About 50% disappeared.—J. H. B.

TEMPERATURE

2617. Regulation of Body Temperature in Rabbits—IV. and V. L. M. Moore (*Amer. J. Physiol.*, 1921, **56,** 361, 365-9).—IV. Rabbits in small boxes with a head-holder do not move, and maintain a constant temperature; they serve as "basal" animals. V. Distilled water NaCl (*m*/6, *m*, 2 *m*, and 4 *m*) in 5 to 10 c.c. doses intravenously raise the temperature 1° to 1·5° C. NaCl (6 *m*) causes a fall of 0·6°, followed by a rise rather over normal. The rise with hypotonic fluids corresponds to a rise of cerebro-spinal pressure, and the fall with the hypertonic fluid to a fall in this pressure, as reported by Weed and McKibben.—W. D. H.

2618. Effects on Hot and Cold Applications. II. Muscles, Liver, Kidneys, and Brain. J. J. R. Macleod and N. B. Taylor (*Lancet*, 1921, ii., 70-73; compare Abstract No. 2186, Vol. V., p. 349).—The spread of temperature (lateral and deep) was observed in the gluteal region (rabbit) by the same methods as before, and the results are given in figures. Hot applications over the liver produced but little effect on that organ compared to muscle; the effects of cold were more marked. Over the kidney the effects of both heat and cold were slight. On application to the head, the brain temperature changed promptly, but caused no general effect on the body temperature. Vascularity is a factor in these various organs.—W. D. H.

SUGAR AND DIABETES

2619. Méthode de microdosage manganimetrique de glucose. G. Fontès and L. Thivolle (*Bull. de la soc. de chim. biol.*, 1921, **3,** 226-37).—The method is recommended for use in blood and cerebro-spinal fluid, as easy, short, accurate, involving neither colorimetry nor consultation of tables, and requiring only small quantities of material. For details of manipulation the full description given must be consulted in the original. —W. D. H.

2620. Dinitrosalicylic Acid: A Reagent for the Estimation of Sugar in Normal and Diabetic Urine. J. B. Sumner (*J. Biol. Chem.*, 1921, **47**, 5-9).—This is a colorimetric reduction process with a differential method to exclude reducing substances in urine other than sugar.—H. E. R.

2621. Effet des injections sucrées intraveineuses sur le sucre du sang, le nombre des globules blancs et l'excrétion de l'acide lactique. V. de Moraczewski and E. Lindner (*J. de physiol. et de pathol. gén.*, 1921, **19**, 202-13).—Intravenous injection of 50 gms. of glucose is eliminated to the extent of 15 gms. in 12 hours, together with an increase in lactic acid and a decrease in phosphates. There was no effect on temperature. A similar injection of fructose has similar effects, with the exception that it causes a rise in body temperature and a fall in leucocyte content. Simultaneous injection of adrenaline diminishes the sugar excreted. Anæmic patients fail to show rise of temperature. Dextrin acts similarly, but is delayed in action. Salvarsan, albumose, and lipoids cause no increase in lactic acid, and a varying effect on leucocyte content.—W. M. B.

2622. Sur la teneur en glycogène du foie et des muscles chez des animaux éthyroïdés. Marie Parhon (*J. de physiol. et de pathol. gén.*, 1921, **19**, 198-201).—Muscles and liver contain less glycogen than normal. The result is thought to be due to defective absorption of carbohydrate from the alimentary canal, and not to increased consumption by the tissues.—W. M. B.

2623. Über sterische Umwandlung von Hexosen durch Organe und Zellen. S. Isaac and E. Adler (*Zeit. physiol. Chem.*, 1921, **115**, 105-29).—Neither muscle nor blood-cells, but the liver alone, of all tissues examined, is capable of transforming lævulose into dextrose. Moreover, this change takes place *only* on perfusion of the surviving organ, minced liver being incapable of bringing about the conversion. The reaction therefore appears to be in some way connected with the intact structure of the cell.—H. W. D.

2624. Über Fesselungshyperglykämie und- glycosurie beim Kaninchen. I. Fujii (*Tohoku J. Exp. Med.*, 1921, **2**, 9-64).—Fastening a rabbit to the operation-table lowers its temperature (as is well known) and increases its blood-sugar. If the fall in temperature is prevented artificially, the change in the blood-sugar is absent.—W. D. H.

2625. Adrenaline Diabetes. C. Achard, A. Ribot, and L. Binet (*Lancet*, 1921, ii., 139-40).—Glucose injected in dogs (intravenously) provokes hyperglycæmia, the amount and duration of which vary with the dose. This sugar is partly excreted in the urine, and partly fixed or burnt; the last process is a rapid one. If adrenaline is also given the total sugar of the blood rises greatly, and the glycæmia lasts longer. This is attributed to loss of glycolytic power. Injection of fresh pancreatic extract has the opposite effect—*i.e.*, increases glycolysis. Adrenaline hyperglycæmia does not occur after extirpation of the pancreas. Adrenaline prevents the action of the pancreatic glycolytic enzyme.—W. D. H.

2626. A propos de la glycosurie adrénalinique. La caféine, poison paralysant du sympathique. E. Bardier, P. Leclerc, and A. Stillmunkes (*Compt. rend. soc. biol.*, 1921, **85**, 281-2).—Caffein (given as double benzoate of caffein and soda, 10 c.c. 2% solution intravenously) inhibits adrenaline glycosuria in the rabbit.—J. H. B.

2627. Adrenaline Hyperglycæmia. A. L. Tatum (*J. Pharm. Expt. Ther.*, Proc., 1921, **17**, 336).—There is no demonstrable evidence of interdependence between the glycogenolysis, as judged by hyperglycæmia, produced by adrenaline and the fall in alkaline reserve which follows the subcutaneous injections of adrenaline in normal animals.—E. M.

2628. Du taux glycémique au cours des cirrhoses du foie et de ses rapports avec la glycosurie alimentaire provoquée. A. Chauffard, P. Brodin, and Zizine (*Compt. rend. soc. biol.*, 1921, **85**, 305-7).—Alimentary glycosuria occurred in 10 cases diagnosed as hypertrophic or atrophic cirrhosis. All had a blood-sugar percentage considerably above the normal.—J. H. B.

2629. High Fat Diet in Diabetes Mellitus. L. H. Newburgh and P. L. Marsh (*Arch. Int. Med.*, 1921, **27,** 699-705).—A record of 45 cases of diabetes, in 40 of which the administration of a diet rich in fat produced satisfactory effects on the blood-sugar.—J. H. B.

2630. Influence of Menstruation on the Food Tolerance in Diabetes Mellitus. J. Rosenbloom (*J. Amer. Med. Assoc.*, 1921, **76,** 1742).—The sugar tolerance is lowered under these conditions.—C. L. E.

2631. The Glycæmic Reaction in its Relation to Transplantable Malignant Tumours. G. L. Rohdenburg (*J. Cancer Res.*, 1920, **5,** 279-89).—A transient hyperglycæmia occurs in rats after injection of adrenaline. Heterologous protein extracts induce hyperglycæmia in normal animals, and in those bearing transplantable tumours, as well as in spontaneous tumour-bearing animals. Autologous protein extracts do not cause a hyperglycæmia in normal or spontaneous tumour-bearing animals; they occasionally cause a hyperglycæmia in animals bearing transplantable tumours, if the autologous tissue be the tumour itself. Homologous protein extracts cause a hyperglycæmia in normal animals and in animals bearing transplantable malignant tumours; they do not cause a hyperglycæmia in animals in which spontaneous malignant tumours are growing. Homologous protein, which is able to induce immunity against subsequent inoculation of a tumour, gives rise to a hyperglycæmia, while autologous protein extract, which has not the power of conferring immunity, does not give rise to a hyperglycæmia when injected into normal animals. A negative glycæmic reaction, therefore, might be interpreted as an inability of the organism to produce antibodies against the substance injected. That such an interpretation is probably correct is shown by the fact that of animals bearing transplanted tumours, 75% of those in which the tumour grows fail to give a glycæmic reaction when injected with extracts of protein of the tumour, while those animals in which the tumour recedes give a glycæmic reaction in 69% of the cases. Animals in which the tumour recedes probably produce antibodies against the tumour, even though these cannot be demonstrated by any method at present known.—W. D. H. (*Abstr. Bacteriol.*).

2632. Le sucre protéidique chez les cancéreux. H. Bierry, F. Rathery, and Mlle. Levina (*Compt. rend.*, 1921, **173,** 56-7).—The authors distinguish between "sucre libre" and "sucre protéidique" in the blood-plasma. They present a table of analyses, showing the increase of the latter in case of cancer.—W. D. H.

RENAL SYSTEM AND URINE

2633. Contraction Waves in Ureter. W. G. Penfield (*Amer. J. Med. Sciences*, 1921, **160,** 36-46).—If obstructed the ureter dilates, usually hypertrophies, and exhibits increased peristalsis; the waves can pass in both directions; the pelvis is the normal pace-maker, but other parts may take on this rôle. Pace-making areas have a more rapid metabolic rate. Refractory period is a factor. Experiments on rabbits, dogs, and on excised ureter in Locke's solution.—W. D. H.

2634. The Stainable Lipoid in the Renal Epithelium and Toxic Effect of the General Anæsthetics. Wm. de B. MacNider (*J. Pharm. Expt. Ther.*, 1921, **17,** 289-317).—There is a larger amount of stainable lipoid material in the kidneys of old dogs than in those of young dogs. Chloroform and ether are more toxic for the kidneys of older animals, so that more extensive degenerative changes and a greater decrease in functional response are produced by these anæsthetics in the older dogs. Chloroform is more toxic for the kidneys than ether, and not only induces more epithelial degeneration, but brings about a greater accumulation of stainable lipoid in the renal epithelium. The

results indicate a definite relationship between the amount of stainable lipoid in the renal epithelium of both normal and naturally nephropathic animals, and the susceptibility of this epithelium to the toxic effects of both ether and chloroform.—E. M.

2635. (1) Gasometric Determination of Nitrogen. (2) Gasometric Determination of Urea in Urine. R. L. Stehle (*J. Biol. Chem.*, 1921, **47**, 11, 13-17).—(1) $CuSO_4$ is the source of oxygen when a Kjeldahl digest is treated with hypobromite, as in the method previously described (Abstract No. 258, Vol. VI., p. 38). (2) Ammonia is removed by permutit, and the urea estimated by hypobromite in a Van Slyke apparatus.—H. E. R.

2636. L'azote titratable par la méthode de Kjeldahl. W. Mestrezat and Marthe P. Janet (*Bull. de la soc. chim. biol.*, 1921, **3**, 88-94, 105-30).—These papers give a complete discussion of the various methods used for the estimation of total nitrogen, these methods being given in detail. The results given by the method of Kjeldahl in urine, etc., do not agree with those given by other methods. The authors conclude that certain nitrogenous substances are not estimated with accuracy by Kjeldahl's method—*e.g.*, pyrazol and pyridine. The nature of these substances in urine (about 2% of the total N) is not mentioned.—E. P.

2637. The Determination of Inorganic Sulphate, Total Sulphate, and Total Sulphur in Urine by the Benzidine Method. C. H. Fiske (*J. Biol. Chem.*, 1921, **47**, 59-68).—Sources of error in the original method of Rosenheim and Drummond (*Biochem. J.*, 1914, **8**, 143) are pointed out, which chiefly affect the accuracy of analyses of urines with a high phosphate or chloride content. The chief modifications proposed consist of a preliminary removal of phosphates by precipitation from alkaline solution with ammonium chloride and finely powdered basic magnesium carbonate, and the employment of acetone for washing the precipitated benzidine sulphate.—J. C. D.

2638. Errors in the Detection of Albumin and Sugar in Urine. E. Renaux (*J. Pharm. Belg.*, 1921, **3**, 90).—The presence of quinine can lead to the indication by Esbach's reagent of too high an albumin content. On the other hand, the biuret test and the reactions with nitric acid, ammonium sulphate, and potassium ferrocyanide in acetic acid solution are rendered less sensitive. Sugar in urine must always be estimated by the use of Fehling's solution, since polarimetric estimations may be vitiated by the presence of lævulose.—W. D. H. (*J. C. Soc.*).

2639. Zur Fluoreszenzbeobachtung bei den Porphyrinen. H. Langecker (*Zeit. physiol. Chem.*, 1921, **115**, 1-8).—It is found that the fluorescence of urines containing small amounts of porphyrin constitutes a slightly more delicate test than the spectroscopic method. Cases of phthisis, acute nephritis, disease of the liver, rheumatism, and conjunctivitis vernalis yielded urines rich in porphyrin, while the urine from a case of hæmolytic icterus contained a particularly large quantity.—H. W. D.

2640. Estimation of Pepsin in Urine. S. Nomura (*Chuo Igak. Zasshi*, 1918, **273**, 1136-42; *Jap. Med. Lit.*, 1920, **5**, 30).—In order to determine pepsin in urine, the phosphates must be precipitated without making the urine too alkaline. Normally sufficient pepsin to digest the protein contained in 4 c.c. of a 1% casein solution is present in 15 to 25 c.c. of urine. An abnormal pepsin content of the gastric juice gives rise to an abnormal concentration of that enzyme in the urine.—W. D. H. (*Chem. Abstr.*).

2641. Über die Bestimmung der Oxalsäure im Harn. E. Salkowski (*Biochem. Zeit.*, 1921, **118**, 259-66).—A reply to Bau's criticism of the author's method (Abstract No. 1156, Vol. VI., p. 172).—H. K.

ENDOCRINE SYSTEM

2642. A Study of Thyroid-Iodine Distribution and Mobilisation. H. B. van Dyke (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 335).—No confirmation was obtained of a previously published statement that a 3 to 4 hours' stimulation of the cervical sympathetic nerve in the dog causes a diminution of the iodine content of the lobe of the thyroid gland on the side of stimulation.—E. M.

2643. Action de la thyroide de chien sur le cœur du lapin neuf et du lapin sensibilisé. J. Demoor (*Compt. rend. soc. belge de biol.*, 1921, 235-7; *Compt. rend. soc. biol.*, 1921, **85,** 235-7).—Le cœur isolé du lapin perfusé au moyen du sérum de Locke (glucosé) oxygéné bat pendant des heures. L'addition d'extrait de thyroide de chien au liquide provoque: I° une légère excitation, 2° un affaiblissement rapide du travail cardiaque allant jusqu'à l'arrêt complet. Le retour du Locke normal ramène l'activité régulière du cœur. Le cœur du lapin sensibilisé à la thyroide ne manifeste aucun fléchissement. Presque toujours il manifeste une excitation exagérée. Ces expériences tendent à faire admettre que certains organes interviennent spécifiquement au cours des réactions dont l'organisme devient le siège tandis qu'il est sous l'influence des antigènes.—E. Z.

2644. Myocardial Necrosis in Hyperthyroidism. E. W. Goodpasture (*J. Amer. Med. Assoc.*, 1921, **76,** 1545-51).—Two cases of hyperthyroidism which died from myocardial necrosis of an acute type.—C. L. E.

2645. Transplantation of the Thyroid and So-Called Interstitial Tissues. S. Voronoff (*Internat. Clin.*, 1921, **1,** 76-84).—Transplantation of a testis into a castrated animal led to disappearance of the eunuchoid symptoms. A case is also described where a thyroid was transplanted from a chimpanzee to a human idiot, who, as a result, showed a marked improvement of mental powers. The transplanted thyroid was observed for 6 years after the operation, and no reabsorption occurred.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2646. Recherches sur la concentration du sang en ions hydrogène après ingestion abondante d'acides ou de bases, et pendant les attaques tétaniques consécutives à l'extirpation des glandes parathyroïdes. R. Ege and V. Henriques (*Compt. rend. soc. biol.*, 1921, **85,** 389-91).—1 litre $\frac{N}{5}$ HCl given to a goat in 24 days produced a blood reaction of P_H=6·80. Dogs in tetanic spasms after parathyroidectomy gave P_H=7·06 to 7·24, that is to say, lower than normal.—J. H. B.

2647. L'onde de cinèses et l'onde de pycnoses dans le thymus de la souris après injection intrapéritonéale de sérum étranger. A. P. Dustin (*Compt. rend. soc. belge de biol.*, June 25, 1921).—L'auteur étudie le nombre de pycnoses et le nombre de mitoses que l'on observe dans le thymus de la souris pendant les jours qui suivent une injection intrapéritonéale d'un sérum étranger aseptique. La courbe de pycnoses et celle des mitoses sont exactement l'inverse l'une de l'autre et suivent un rythme obéissant à des lois déterminées.—E. Z.

2648. Réaction vasomotrice de la surrénale à l'adrénaline. L. Hallion (*Compt. rend. soc. biol.*, 1921, **85,** 146-9).—In the dog an intravenous injection of adrenaline (4 mg.) causes a diminution in the volume of the suprarenal gland.—J. H. B.

2649. The Effect of Hæmorrhage on the Sympathetics. H. McGuigan (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 328).—Hæmorrhage increases the sensitivity of the sympathetics, as judged by the response in blood-pressure to the injection of adrenaline. The action seems mainly peripheral.—E. M.

2650. Disorders of the Pituitary Gland. H. Cushing (*J. Amer. Med. Assoc.*, 1921, **76,** 1721-6).—A lecture in which considerable stress is laid on the tendency to extol and exploit our present very rudimentary knowledge of the pituitary and other endocrine

glands. "The Lewis Carroll of to-day," says the author, "would have Alice nibble from a pituitary mushroom in her left hand and a lutein one in her right, and presto! she is any height desired." The pathology of the pituitary is in a particularly unsatisfactory condition, and even the relation of the gland to diabetes insipidus is doubtful.—C. L. E.

2651. Azione dell' ipofisma sulla diuresi salina. F. Pentimalli (*Lo sperimentale*, 1921, **75,** 145-59).—Experimenting with dogs, the author finds that if diuresis is produced by intravenous transfusion of saline, it is only slightly affected by the injection of pituitrin. This substance produces an immediate stoppage of the flow of urine, this being due to a renal vaso-constriction; the stoppage, however, is of very short duration; the diuresis reappears, and continues as if no pituitrin had been injected. Pituitrin further causes a very transient fall of blood-pressure under these conditions; to this fact, as well as to the vaso-constriction produced, is due the slight antidiuretic action of the substance.—E. P.

2652. Diabetes Insipidus. E. E. Larson, J. F. Weir, and L. G. Rowntree (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 333).—Pituitrin treatment of diabetes insipidus produced diminished excretion of water, acid bodies, and nitrogenous substances in the urine. Pituitrin raised the water threshold of the kidney. If water drinking was pressed in diabetes insipidus during the oliguria following pituitrin, there was an increase in blood-volume and water intoxication, and in one case demonstrable œdema resulted.—E. M.

2653. La diurèse normale et provoquée des chiens sans hypophyse. B. A. Houssay and E. Hug (*Compt. rend. soc. biol.*, 1921, **85,** 315-7).—Experiments carried out on 45 dogs. Removal of the pituitary gland does not lead to change in the quantity of 24 hour urine. Polyuria and oliguria after the operation are transitory. Diuresis after ingestion of water took place more slowly in animals without the pituitary gland, and yet in these animals pituitary extract was abnormally ineffective in producing diuresis. —J. H. B.

2654. Syndrome adiposo-génital et diabète insipide expérimental. J. Camus and G. Roussy (*Compt. rend. soc. biol.*, 1921, **85,** 296-7).—A dog in which an experimental lesion at the base of the brain was produced at the end of 1919 has developed the syndrome of obesity and testicular insufficiency. Its weight has increased from 15 to 26 kgm., and it suffers from diabetes insipidus, passing 3 to 4 litres urine in 24 hours. —J. H. B.

2655. Hypophysenbestrahlung und Eierstockstätigkeit. L. Fränkel and F. C. Geller (*Berlin. klin. Woch.*, 1921, **58,** 565-70).—By radiation of the pituitary with X rays in the rabbit the histological changes produced are described, which are accompanied by arrest of activity of the generative organs. This is supported by clinical evidence in cases of hypophyseal tumours.—W. D. H.

2656. Hormones and the Emotions. S. Naccarati (*Med. Record*, New York, 1921, **99,** 910-5).—A fruitful subject for speculation, of which the author takes full advantage. —W. D. H.

2657. Treatment of Sterility by Organic Extracts. A. Bercovitch (*Med. Record*, New York, 1921, **99,** 1052-5).—"The ductless glands and their hormones come to us as peaceful conquerors who brook no denial. They lighten our darkness, etc." This quotation may tempt readers to look up the original. I mention this and the preceding paper as typical of many which are now being printed.—W. D. H.

2658. Zum Wesen und Wirken der endokrinen Drüsen. C. Hart (*Berlin. klin. Woch.*, 1921, **58,** 533-6).—A commentary on the work of others, with speculations on the inter-relationships of the endocrine organs.—W. D. H.

2659. Die Stellung des Bindegewebes im endokrinen System. M. Fränkel (*Berlin. klin. Woch.*, 1921, **58,** 536-8).—Speculative in relation to effects of radiation of endocrine glands. The thymus is regarded as the regulator of connective tissue growth.—W. D. H.

REPRODUCTIVE SYSTEM

2660. Evolution du testicule après ligature ou résection du canal déférent et après ligature des vaisseaux testiculaires. E. Retterer and S. Voronoff (*Compt. rend. soc. biol.*, 1921, **85,** 153-6).—Ligature or resection of the vas deferens at first stimulates the development of Sertoli's cells. If, however, the testicular vessels are included in the ligature, spermatogenesis is completely suppressed, and the testicular epithelium is replaced by fibrous tissue.—J. H. B.

2661. The Interstitial Cells of the Urodele Testis. R. R. Humphrey (*Amer. J. Anat.*, 1921, **29,** No. 2).—The testes of urodeles are favourable for a study of the correlations between interstitial cell development and the spermatogenetic cycle; in them the changes of spermatogenesis are separated to an extent seldom approximated in the testes of higher vertebrates. The development of interstitial cells in adult urodeles is found to be associated with regressive changes in the testis at the close of the spermatogenetic cycle. Only flattened or spindle-shaped stromal cells surround the lobules during spermatogenesis. When the spermatozoa are extruded, these cells increase in number and volume, accumulate lipoids, and become typical interstitial cells. As such, they persist a varying length of time. Their final degeneration or reversion to a stromal cell type tends to follow more or less closely the disappearance of degenerating lobules. The interstitial cells clearly can perform no trophic function during the progressive phases of the following sexual cycle, since their degeneration or reversion may occur several months before spermatogenesis begins. Neither does this study establish any causal relation between their development and the appearance of the secondary sexual characters or mating instincts. Their development around degenerating lobules after extrusion of the spermatozoa is the outstanding feature.—W. D. H. (*W. I.*).

2662. Sur l'existence et le rôle d'un tissu endocrinien dans le testicule des urodèles. M. Aron (*Compt. rend.*, 1921, **173,** 57-9).—The authors believe that this tissue is analogous to the interstitial tissue of mammals and birds (see Abstract No. 2267, Vol. VI., p. 320). They describe its histological structure; it begins to form before spermatogenesis occurs, and the nuptial period coincides with its fullest development. Destruction by cautery leaving the seminiferous tubes intact leads to a disappearance of sexual appetite and of secondary sexual characters.—W. D. H.

2663. Sur la glande interstitielle du testicule embryonnaire chez les mammifères. M. Aron (*Compt. rend. soc. biol.*, 1921, **85,** 107-10).—In sheep and pigs the interstitial tissue of the testicle differs morphologically in the adult from that seen in young animals below the adult stage. This "primary interstitial gland" gradually disappears as puberty draws near.—J. H. B.

2664. De la corrélation physiologique entre les ovaires et l'utérus. F. Nielsen (*Compt. rend. soc. biol.*, 1921, **85,** 368-9).—Experiments showing the part played by the interstitial tissue of the ovary in affecting the relationship between corpus luteum or epithelial cells and the uterine mucosa.—J. H. B.

2665. Action of Vegetable Cathartics and of Bile on the Uterus. S. Okamoto (*Kyoto Igaku Zasshi*, 1918, **15,** 68-83; *Jap. Med. Lit.*, 1920, **5,** 32).—The uterus of the rabbit was stimulated by administration of small and medium doses of the cathartics, and was depressed by large doses. Bile usually exerted a stimulating action in the rabbit and a depressing action in the rat.—W. D. H. (*Chem. Abstr.*).

2666. Zur Frage der klimakterischen Blutdrucksteigerung. O. Schlesinger (*Berlin. klin. Woch.*, 1921, **58,** 545-6).—The rise and fluctuations in blood-pressure at the menopause vary greatly, and one factor is whether ovarian functions cease suddenly or gradually. A parallel is drawn between the climacteric and "war amenorrhœa."

In both cases psychical factors are present, and in both "endocrine disturbances" (a convenient expression nowadays to the speculative mind) is at the root of the matter.—W. D. H.

2667. Time of Ovulation. P. C. F. v. d. Hoeven (*Ned. Maandschrift v. Geneesk.*, 1921, **9,** 16-22).—The author considers that ovulation does not occur regularly. The life of the ovum and spermatozoon is very short (perhaps some hours, Gönner); therefore fecundation is only possible just after ovulation. The author's opinion is that external influences (stimulations) are of great importance to ovulation. The chance of pregnancy just after menstruation is in full accordance with this idea. The author concludes that menstruation is independent of ovulation.—R. B.

2668. Reproduction in the Domestic Fowl—XVIII. R. Pearl and W. F. Schoppe (*J. Exp. Zool.*, 1921, **34,** No. 1).—Detailed counts are given of the number of visible oöcytes on the ovaries of 36 birds, including various breeds. The mean number of visible oöcytes on the ovaries of different kinds of birds reflects the normal fecundity or laying activity of the same kinds of birds. This relation does not hold with any exactitude for differences in fecundity between individual birds. In Barred Plymouth Rock fowls the number of visible oöcytes increases with the advancing age of the bird within the age limits of 6 months and 37 months. The probable explanation of this phenomenon is given. By removing a portion of the ovary and causing it to regenerate, the total number of oöcytes developing to visible size in the lifetime of the bird is caused to increase from 33 to 68% over the number which develop in the normal, unoperated bird. This increase is statistically significant.—W. D. H. (*W. I.*).

2669. Influenza delle iniezioni di estratti fetali, placentari, uterini sui corpi lutei gravidici di cavie isteroctomizzate. C. Verdozzi and R. Cavalieri (*Arch. di Fisiol.*, 1920, **18,** 1-13).—Subcutaneous injections of aqueous extracts of guinea-pig embryos into guinea-pigs on which hysterectomy had been performed during the first half of pregnancy prevent, up to a point, the rapid involution which the corpora lutea undergo when hysterectomy only is performed. Under the same experimental conditions, injections of placental and uterine extracts have no effect of the sort. This appears to support Verdozzi's opinion that the persistence of the corpus luteum during pregnancy is, at least in part, due to "chemomorphotic" substances passing through the placenta from the embryo to the mother.—C. d. F.

2670. Über das Blutvolumen in der Schwangerschaft. A. Mahnert (*Arch. f Gynäk.*, 1920, **114,** 168-96).—During pregnancy the volume of circulating blood is increased but the red blood-cell count remains unaltered. There is, therefore, not merely a dilution of the blood, but also a compensating increase in the number of red corpuscles. A similar but slightly less proportionate increase occurs in the serum proteins.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2671. L'hypercholestérinémie de la grossesse. M. Watrin (*Compt. rend. soc. biol.*, 1921, **85,** 263-5).—Estimations of the excess of cholesterol in the blood during later months of pregnancy. This is not considered to be related to the corpus luteum, but to a deficiency of liver function.—J. H. B.

2672. Greffes d'œufs de triton dans la cavité péritonéale de salamandres. A. Weber (*Compt. rend.*, 1921, **172,** 1687-8).—The author modifies his previous opinion (Abstract No. 2259, Vol. VI., p. 328). The harmful effect on eggs is more physical than chemical. Triton's eggs in the peritoneum of the salamander are not killed; their activity is inhibited, some substance in the peritoneal fluid acting as a narcotic. After removal they resume segmentation.—W. D. H.

2673. Schwankungen im Chlorid-Stoffwechsel unter dem Einfluss der menstruellen Vorgänge. W. Eisenhardt and R. Schaefer (*Biochem. Zeit.*, 1921, **118,** 34-8).—As a rule immediately before or during the menstrual period there is an increased content of chloride in the circulating blood, as estimated by Bang's micro-method.—H. K.

MILK

2674. La répartition des substances salines et des éléments minéraux dans le lait. C. Porcher and A. Chevalier (*Compt. rend.*, 1921, **172,** 1605-7).—The authors point out the old difficulty of determining the mineral constituents of milk by incineration, for during the process inorganic salts may be formed from organic material (caseinogen, phosphatides, etc.) rich in S and P. By dialysis, filtration through a porcelain candle, and cryoscopy more accurate knowledge of the physico-chemical state in milk can be obtained, and the authors give the composition of a saline mixture which mixed with gelatin or egg-white, which they believe imitates the natural state of things. They mean to apply themselves next to blood.—W. D. H.

2675. Présures végétales. E. Couvreur and P. Chosson (*Compt. rend.*, 1921, **172,** 1678-9).—Extracts of the root of *Solanum dulcama* and of stems and leaves of *Helleborus fœtidus* curdle milk rapidly at 37° C. No proteose is found in the whey. Whether such extracts are proteoclastic was not determined.—W. D. H.

2676. Zur Frage der Verwertung der Trockenmilch vom Standpunkte der Vitaminlehre aus. W. Stepp (*Med. Klinik*, 1921, **17,** 287-8).—In dried milk the vitamins of the fresh product are well preserved, so that it is suitable for infant feeding.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

2677. Vitamins of Milk. M. J. Rosenau (*Boston Med. and Surg. J.*, 1921, **184,** 455-8).—"Milk is rich (*sic*) in all the known vitamins." A and B are more resistant to heat, canning, etc., than C. Why take 8 columns to reiterate the news ?—W. D. H.

PHARMACOLOGY

2678. Blut- und Stoffwechsel-Untersuchungen bei Radiumbestrahlung. J. Hauenstein (*Münch. med. Woch.*, 1921, **68,** 809-10).—Investigation of blood-picture during radium treatment for uterine carcinoma in 22 women. In general there was a diminution of red cells from 4 to 3 million when high radium doses were used. Polymorphonuclear leucocytes doubled themselves after a first dose; this increase passed off in a day or two, and subsequent doses produced less effect. The examination of the urine showed that under the influence of radium a N retention took place.—J. H. B.

2679. Über die Gefässwirkung organischer Kationen und ihre Beeinflussung durch anorganische Ionen. W. Teschendorf (*Biochem. Zeit.*, 1921, **117,** 267-85).—The action of a number of salts of strong organic bases was investigated on a Laewen-Trendelenburg preparation of the frog's vascular system. Acetylcholine had the most powerful constricting action. Nitrosocholine was much less active, and guanidine still less. In the homologous series of quaternary ammonium bases tetramethylammonium chloride was intermediate between acetylcholine and nitrosocholine, the tetraethyl derivative resembled guanidine, whilst the tetrapropyl derivative depressed the vascular tonus. The action of all the above organic cations was inhibited by the divalent inorganic cations in the order: Mg, Ca, Sr, Ba. A reversal of the action of acetylcholine and nitrosocholine was observed when an excess of OH ions circulated for a long time in the Ringer's solution.—H. K.

2680. Leucopénie et hyperleucocytose chez le nourrisson par ingestion de minimes quantités d'iode. H. Dorlencourt, G. Banu, and A. Paychère (*Compt. rend. soc. biol.*, 1921, **85,** 304-5).—In an infant of 6 months, a leucocyte count of 13,000 fell to 8,600 20 mins. after ingestion of 2·8 mg. of iodine taken as solution in KI. Two hours later the count rose to 17,900.—J. H. B.

2681. Enlargement of the Spleen in Experimental Acidosis. R. Householder (*J. Amer. Med. Assoc.*, 1921, **76,** 1556-9).—Subcutaneous injection of 0·1 normal HCl (1 to 5 c.c. daily) reduces the CO_2 fixing power of the blood and produces anæmia with splenic enlargement. The condition produced is in some respects similar to that in uræmia and heat-stroke.—C. L. E.

2682. The Pharmacology of Some Amines. P. J. Hanzlik (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 327).—The toxicity of various amines of importance in art and industry was tested. It was found that phenylenediamines are more toxic than butylamines, and that, of the phenylenediamines, the dimethyl is about twice as toxic as the diethyl derivative. The toxicity of the butylamines increases with increase in molecular weight. —E. M.

2683. The Comparative Toxicity of Thymol and Carvacrol (Isothymol). A. E. Livingston (*J. Pharm. Expt. Ther.*, 1921, **17,** 261-76).—As the result of experiments on paramœcia and rabbits it appears that thymol and carvacrol are equally toxic. Their action on earthworms is practically the same, and it is suggested that carvacrol may be useful as a substitute for thymol in hookworm disease.—E. M.

2684. The Relation of Substitution in the Carbinol Group to the Pharmacological Action of Some Phenyl Carbinols. J. P. Quigley and A. D. Hirschfelder (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 326).—Various derivatives of saligenin were produced in which the "inactive hydrogens" in the CH_2OH group were substituted by other groups. This was found to lessen or remove the local anæsthetic action.—E. M.

2685. Effect of Tobacco Smoking on Human Sensory Thresholds. W. L. Mendenhall (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 333).—Sensory thresholds were determined by placing the index and middle fingers in salt solution electrodes, using the Martin method of quantitative faradic stimulation. The effect of smoking, as shown by variation in the threshold, depended upon the state of the sensory mechanism at the time of the experiment. A normal condition was hardly influenced. In cases of high irritability smoking had a depressant effect, and a stimulating action when the irritability was depressed. Resting had the same effect on the sensory threshold as smoking, and tended to bring it back to normal, but, of the two, smoking was the more effective. The smoking of cubeb cigarettes always stimulated the sensory mechanism. As regards tobacco, non-smokers showed the same reaction as smokers.—E. M.

2686. Effect of Tobacco on Man. W. J. Gies, M. Kahn, and O. V. Limerick (*New York Med. J.*, June 1, 1921, 809-11).—Pious opinions, but acceptable to the smoker. It is not harmful in moderation; it may be helpful to some; it is harmful to a few, and it should be eschewed by juveniles.—W. D. H.

2687. Liver Regeneration following Chloroform Injury as influenced by Feeding on Casein or Gelatin. N. C. Davis and G. H. Whipple (*Arch. Int. Med.*, 1921, **27,** 679-87). —The authors produce liver necrosis in dogs by the use of chloroform. Normally this is completely repaired in 7 to 10 days. They study the effect of various diets on the rate of repair. They find that on a diet of gelatin or casein the process of liver repair is almost complete on the 9th day. This regeneration is comparable to that obtained with a meat diet, and greater than that on a fat diet or when fasting.—J. H. B.

2688. Absorbability of Purified Tincture of Digitalis. R. W. Scott (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 343).—A chloroform soluble digitalis body was administered by mouth to hospital patients suffering from auricular fibrillation, and it was evident from the slowing effect on the heart that absorption occurred in 1 to 2 hours. Where there was no circulatory stasis absorption occurred in 1 hour.—E. M.

2689. Presence in Digitalis of a Principle which is Eliminated Rapidly. M. S. Dooley (*J. Pharm. Expt. Ther.*, 1921, **17,** 277-88).—Specimens were examined in order to determine the difference between the amounts required to cause death following the

intravenous administration in the cat in short periods as contrasted with the amounts required in longer periods. The results are interpreted as indicating the presence in the digitalis leaf of a substance having a shorter period of cardiac action than that of any true digitalis body hitherto studied.—E. M.

2690. The Influence of the Oil of Chenopodium on the Heart of the Turtle. W. Salant and Battle (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 331).—Oil of chenopodium applied to the heart of the turtle *in situ* produced slowing and a gradual diminution of amplitude. Stimulation of the vagi after treatment with chenopodium was ineffective. Pilocarpine removed the effect of the oil on the vagi. Cardiac depression was also produced by oil of chenopodium after the application of atropine.—E. M.

2691. Über Harnstoff als Diureticum. H. Strauss (*Berlin. klin. Woch.*, 1921, **58,** 375-6).—A more extensive use of urea as a diuretic in clinical work is urged.—W. D. H.

2692. L'action diurétique de l'allylthéobromine. C. Heymans (*Arch. internat. pharmacodyn. et thér.*, 1921, **25,** 485-92).—The author injects Ringer's solution intravenously into a rabbit. He shows that the rate of excretion by the kidney of the injected liquid is greatly increased under the influence of allyltheobromine.—J. H. B.

2693. Recherches au sujet de l'existance d'un complexe purgatif dans les drogues eccoprotiques. F. Daels (*Bull. de l'acad. roy. de méd. Belgique*, 5ème sér., **1,** 185-94).—Les drogues eccoprotiques renferment des complexes purgatifs constitués par la réunion d'un glucoside à base d'anthroquinone, d'un ferment analogue à l'émulsine et d'un coferment minéral.—E. Z.

2694. Liberation of Free Salicylic Acid from Salicylate in the Circulation. P. J. Hanzlik (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 329).—Raising the CO_2 content of the blood by asphyxia did not liberate salicylic acid from sodium salicylate in dogs and cats, although the P_H of the blood was decreased from 7·4 to 6·8. It does not appear, therefore, that the more common occurrence of left-sided than right-sided endocarditis in rheumatic fever can be explained by the liberation of free salicylic acid in the venous blood of the right heart.—E. M.

2695. The Pharmacological Action of Organic Lead Compounds. E. C. Mason (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 340).—The first intravenous injection of the chloride or acetate of triethyl lead into a dog produces fall in blood-pressure, great respiratory disturbance, and increased intestinal activity. The second and subsequent injections produce entirely different results. The blood-pressure now rises in a way similar to that produced by adrenaline, and the whole condition is the reverse of that following the first injection. The action on the blood-pressure and respiration is produced after atropine and after both vagi are cut. When injected into pithed animals, these preparations have no action on the blood-pressure. Also Abstract No. 2275, Vol. VI., p. 330.—E. M.

2696. Further Observations on the Action of Heavy Metals. W. Salant and N. Kleitman (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 332).—The benzoate, acetate, and succinate of mercury had less toxic action on the heart of turtles than the chloride which, even in very dilute solution, produced delirium cordis. Lead acetate, although producing pronounced depression, had less action than mercury. The heart of frogs was not so susceptible to these heavy metals as that of turtles.—E. M.

2697. Les arsénobenzènes. II. Le Galyl. F. de Mytennaere (*Bull. de l'acad. roy. de méd. Belgique*, 5ème sér., 1921, **1,** 249-56).—Le tétraoxydiphosphotétraaminodiarsénobenzène sodique vendu dans le commerce sous le nom de galyl devrait contenir 35 As et 7·2% P. Loin de présenter cette composition le galyl ne contient que 16·43 à 19·48 As et 3·91% P. Le produit ne répond pas à la formule qu'on lui à donée et de plus cette préparation n'est pas constante et présente une grande alterabilité.—E. Z.

2698. Therapeutic Efficiency of Silver Arsphenamine Sodium. Helen Dyer (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 329).—The parasitocidal action of this compound

was determined in the case of albino rats infected with *trypanosoma equiperdum*. The minimal effective dose of this silver derivative based on its arsenic content was approximately 300% smaller than that of arsphenamine or neoarsphenamine. Its toxicity was only slightly greater. Whether silver arsphenamine is more efficient in bringing about a permanent cure of syphilis is not known.—E. M.

2699. Saligenin: Its Mercury Derivative and Allied Compounds. A. D. Hirschfelder, M. C. Hart, and F. J. Kucera (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 325).—The advantages and uses of saligenin (salicyl alcohol) as a local anæsthetic are described. Saligenin and other phenylcarbinols are also mild antiseptics. Two mercury derivatives of saligenin have been made. They have the same antiseptic action as mercuric chloride, but are much less irritating to mucous membranes. The sodium salt of mercury saligenin is being used for the treatment of gonorrhœal urethritis. When saligenin and its derivatives were injected into rats infected with a trypanosome or a spirillum, no evidence of a chemotherapeutic action was obtained.—E. M.

2700. Action of Cocaine on the Cerebrum. D. I. Macht and W. Bloom (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 331).—1 mgm. of cocaine produced inco-ordination, slowness of movement, and loss of memory in albino rats as tested by the circular maze technique. There was never any evidence of a primary stimulation of the cerebrum. The various components into which the cocaine molecule can be split up—ecgonine hydrochloride, benzoyl-ecgonine, sodium benzoate, and methyl alcohol—when injected individually or as mixtures, did not cause the same action as their chemical combination in the form of cocaine.—E. M.

2701. Die Wirkung des Pilocarpins auf die Blutzusammensetzung. A. Bornstein and R. Vogel (*Biochem. Zeit.*, 1921, **118,** 1-14).—Pilocarpine administered to dogs alters the distribution of water in the body, the blood showing increased content of hæmoglobin, corpuscles, and serum proteins. This change is only partially to be attributed to excretion of water from the body. In addition, pilocarpine produces hyperglycæmia in dogs and rabbits. Extirpation of the pancreas has no inhibiting action on these results, but atropine is antagonistic to all.—H. K.

2702. Action du sulfate de quinidine sur la fibrillation auriculaire. F. C. Arrillaga and C. P. Waldorp (*Compt. rend. soc. biol.*, 1921, **85,** 313-4).—Favourable results were obtained in arresting clinical fibrillation by the use of 0·3 gm. quinidine 3 times a day after first diminishing the ventricular rate with digitalis.—J. H. B.

2703. Tratamiento de la arritmia perpetua por el sulfato de quinidina (estudio electrocardiografico). F. C. Arrillaga and C. P. Waldorp (*Semana Médica*, 1921, **28,** No. 17).—Chez 5 malades on obtint la disparition de la fibrillation auriculaire par un traitement *ab ore* par le sulfate de quinidine.—B. A. H.

2704. Modificazioni istologiche del fegato prodotte dall' atropina. A. Rossi (*Arch. di Fisiol.*, 1920, **18,** 15-9).—After subcutaneous injections of atropine sulphate into guinea-pigs, changes take place in the cells of the liver which are analogous to, if not identical with, those caused by vagotomy.—C. d. F.

2705. Quantitative Messung der zeitlichen Caffeinausscheidung beim Menschen nach einer neuen biologischen Methode. E. Friedberg (*Biochem. Zeit.*, 1921, **118,** 164-84).—The method depends on the observation that there is a sharp contraction of the transversely striped musculature of the frog at a concentration of caffeine of 1 in 3,500. The caffeine in urine is isolated from the dried residue by chloroform extraction. Experiments on man indicate that diuresis is not solely dependent on the dose of caffeine, but partially on the water content of the tissues. The cessation of excretion of caffeine is early, possibly due to the degradation of the caffeine to a methylxanthine. The smallest proportion of caffeine taken by mouth and recognisable in the urine is 10 mgm.—H. K.

TOXICOLOGY

2706. Toxicity of Putrid Food. W. G. Savage (*J. Hygiene*, 1921, **20,** 69-84).—Much canned food is condemned merely from the examination of the tin. Outbreaks of poisoning are unknown unless harmful bacteria or their products are present. Still, incipient putrefaction is not *per se* harmful. Many races habitually eat their food "high." This is not unknown among civilised races. Two fallacies underlie theories of food poisoning—one is the now exploded "ptomaine" idea; the other is that subcutaneous injection causing death in animals is a criterion of harmful effects when food is eaten.—W. D. H.

2707. On Acute Yellow Atrophy of the Liver and the Fatty Infiltration of the Liver and Kidney which Results from the Action of Poisons. A. G. R. Foulerton (*J. Path. and Bact.*, 1921, **24,** 257-71).—The author has investigated cases of poisoning by trinitrotoluene, arsenobenzol compounds, diphenylchlorarsine, antimony tartrate, and mercuric chloride. Pathological changes in the liver and kidney are described; the fatty changes in the liver are regarded as being caused by a failure of the fat metabolising functions of the liver.—W. E. G.

2708. Le bleu de méthylène, corps hyperthermisant. C. Heymans and E. Maigre (*Compt. rend. soc. biol.*, 1921, **85,** 141-3).—The intravenous injection of 20 c.c. of 1% methylene blue into dogs, normal or anæsthetised, causes a rise of rectal temperature from 39° to 43° C. in 90 mins. Death follows in another hour.—J. H. B.

2709. Acid Fuchsin Convulsions in Frogs. J. E. Thomas (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 334).—Certain procedures on the brain of frogs, such as the removal of one cerebral hemisphere and injuries to, or removal of, the olfactory lobes, were effected, and their influence on acid fuchsin poisoning determined. All operations on the central nervous system were found to hasten the onset of convulsions. The destruction of one cerebral hemisphere only did not influence the convulsions on one side of the body more than the other. It is concluded that cerebral inhibition is a minor factor, if it is a factor at all, in determining the onset of acid fuchsin convulsions in frogs.—E. M.

2710. Variability in Susceptibility to Poison Ivy. E. D. Brown (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 335).—Six out of 9 students developed a skin reaction when a portion of fresh leaf of poison ivy was applied to the arm overnight; 7 students out of 9 were susceptible to a drop of tincture made from the fresh leaves. A substance was extracted from the leaves having the appearance and properties of a fixed oil (probably the toxicodendrol isolated by Pfaff), and it always produced a skin reaction. There was great variability in reaction from an erythema to a vesicular eruption and sloughing. The eruption could spread via the lymphatics or bloodvessels to other portions of the skin from that part in contact with the irritant. Those who had been once poisoned were more susceptible to the action of the poison.—E. M.

2711. Action anticonvulsivante du chlorure de calcium. Chlorure de calcium et strychnine. A. Pic, S. Bonnamour, and Raymond (*Compt. rend. soc. biol.*, 1921, **85,** 96-7).—A subcutaneous injection of 1 c.c. of 10% $CaCl_2$ will stop convulsions produced by 0·5 c.c. of 1 in 10,000 strychnine sulphate in a frog.—J. H. B.

2712. Atropin und Adrenalin als Gegengifte des Morphiums. A. Bornstein (*Deutsch. med. Woch.*, 1921, **47,** 647).—In morphine poisoning atropine is of little use. Adrenaline (0·7 to 0·8 mg.) is recommended.—W. D. H.

2713. Comparative Toxicity of Alcohol, Caffeine, and Nicotine. D. I. Macht and W. Bloom (*J. Pharm. Expt. Ther.*, Proc., 1921, **17,** 330).—The action of these drugs was studied by injecting them into albino rats which had been previously trained to find

their way in the shortest time and without errors to the centre of a maze, and noting their influence on the behaviour of the rats. The smallest doses of each drug necessary to impair the efficiency of the rats' movements were as follows: 10 mgm. of caffeine, 0·006 mgm. of nicotine, and 40 to 50 mgm. of alcohol. The toxicity of these drugs was also determined by noting their effect on the development of tadpoles. It was found that 1:100 of ethyl alcohol was less toxic than 1: 50,000 nicotine, and that the latter was less toxic than 1: 10,000 caffeine.—E. M.

2714. Effect of Ethanol, Caffeine, and Nicotine on Behaviour. D. I. Macht, W. Bloom, and G. C. Ting (*Amer. J. Physiol.*, 1921, **56,** 264-72).—More rats in mazes. All three drugs depress, the least powerful being placed first, and the most powerful last, in title.—W. D. H.

2715. Giftwirkung. Über die Wirkung des m- und p-Nitrophenols auf Invertase. P. Rona and E. Bach (*Biochem. Zeit.*, 1921, **118,** 232-53).—The inhibitory action of these phenols is a time process. There is also a distinct threshold value for each, beyond which only a relatively small variation of concentration is possible without producing complete inhibition. The process is not reversible, this being attributed to an irreversible destruction of the ferment.—H. K.

2716. Giftwirkung. Über die Wirkung des Chinins auf Invertase. P. Rona and E. Bloch (*Biochem. Zeit.*, 1921, **118,** 185-212).—The inhibitory action of quinine hydrochloride on invertase is dependent on the P_H of the solution. The more alkaline, the greater the toxic effect. This indicates that the free base is the active agent. The same applies to the action on paramœcia. Optochin, eucupin, and vuzin behave similarly, the two former being equivalent to quinine; vuzin is considerably more active. Quinidine has a greater toxic effect than quinine.—H. K.

2717. Giftwirkung. Über die Wirkung des Chinins auf Serumlipase. P. Rona and D. Reinicke (*Biochem. Zeit.*, 1921, **118,** 213-21).—Quinine hydrochloride inhibits the action of lipase similarly to the inhibition produced by atoxyl (Abstract No. 101, Vol. VI., p. 14). The action depends on the P_H of the medium, being more pronounced with increasing P_H, and is independent of the particular salt of quinine used. The inhibiting action on animal sera is only obtained at concentrations of quinine 100 to 1,000 times that observed with human sera.—H. K.

PATHOLOGY

2718. The Diet Factor in Pellagra. W. H. Wilson (*J. Hygiene*, 1921, **20,** 1-59).—From his studies in Egypt the author concludes that pellagra is the ultimate result of protein deficiency. This deficiency may be due to insufficient amount in the food, to its indigestibility, or to digestive disturbances; parallel to this, 3 types of pellagra are recognisable. Indicanuria is looked on as an important indication of loss of protein in the intestine. It is related to deficiency of the gastric HCl, for then the intestine is invaded by bacteria and the formation of secretin is insufficient to provoke the pancreatic flow. Labour is said to raise the level of protein requirement, and is therefore a causative factor of pellagra in communities when the protein supply is on the borderline of sufficiency. Deficiency of cholesterol may be related to some of the symptoms. —W. D. H.

2719. High Blood-Pressure Stasis. A. R. Elliott (*J. Amer. Med. Assoc.*, 1921, **76,** 1467-70).—Experience indicates that while at all times and in all types of high blood-pressure the advent of circulatory stasis is of the utmost gravity, when it is associated with renal function failure it proves to be virtually a terminal development.—C. L. E.

2720. Reactions of the Nasal Cavity and Post-Nasal Space to Chilling of the Body Surface—I. S. Mudd, A. Goldman, and S. B. Grant (*J. Exp. Med.*, 1921, **34,** 11-45).—See Abstract No. 1512, Vol. VI., p. 221.—C. L. E.

2721. Calcium Oxalate in Tuberculous Sputum. Albert and Alexandre Mary (*Mem. rev. soc. cient. "Antonio Alzate,"* 1920, **38,** 351-3).—The sputum frequently contained the crystals, which resembled those found in urinary sediments. Pulmonary excretions appear to be influenced by pathological modifications of metabolism, and by visceral diseases.—W. D. H. (*Chem. Abstr.*).

2722. Pemphigus Menstrualis (Duhring's Disease). C. D. Cramer (*Ned. T. v. Verleskunde en Gynæcol.*, 1920, **28,** 1-33).—This deals with the cause of anaphylactic phenomena during menstruation. It is possible that proteins are given periodically to the body by the reproductive glands. But it is also possible that the antigen is coming into the body *per os*, and is assimilated periodically. This opinion is strengthened by the fact that administration of aperients some days before menstruation was successful in preventing disturbances during the menstruation period.—R. B.

2723. Sur les modifications de la composition du sang au cours du choc anaphylactique. H. de Waele (*Compt. rend. soc. biol.*, 1921, **85,** 234-5).—The secretion of antithrombin in a dog following anaphylactic shock is rapid and of short duration. Also immediately after this form of shock the blood contains less fibrin, less globulin, but more albumin than usual.—J. H. B.

2724. Récherches expérimentales sur la théorie de l'anaphylaxie. E. Pesci (*J. de physiol. et de pathol. gén.*, 1921, **19,** 226-49).—The papers discuss the mechanism of anaphylactic shock, chiefly consisting in bringing the facts into relation with the properties of colloidal systems. In the first paper a number of experimental facts bearing on the question are given.—W. M. B.

2725. Les alternance entre l'accoutumance et l'anaphylaxie (Études sur le ferment lactique). C. Richet, Eudoxie Bachrach, and H. Cardot (*Compt. rend.*, 1921, **172,** 1554-7).—If the lactic ferment is cultivated for several generations in slightly toxic media, and one follows its behaviour systematically, one observes at one time habituation, at another anaphylaxis. The subject, being outside the scope of these abstracts, must be studied in detail in the original paper. The authors make the interesting postulate that there is a mobility of biological characters, a sort of functional polymorphism.—W. D. H.

2726. Serum Desensitisation. G. M. Mackenzie (*J. Amer. Med. Assoc.*, 1921, **76,** 1563-6).—A fatal case of anaphylaxis in a "horse asthmatic" is described. It is recommended that patients who have had asthma, and who give a positive reaction to intracutaneous tests, should be desensitised by giving a dose of 0·025 c.c. subcutaneously, followed by doubled doses every ½ hour till 1 c.c. has been given. Then 0·1 c.c. is given intravenously; the dose is doubled every 20 mins. until 25 c.c. have been given without reaction, and so on.—C. L. E.

2727. Changes in Leucocytes and Alkali Reserve of Blood in Experimental Infections. E. F. Hirsch (*J. Inf. Dis.*, 1921, **28,** 275-8; **29,** 40-6).—(1) Rabbits were injected intravenously with cultures of pathogenic microbes, and the leucocyte changes and the alkali reserve then observed at different intervals of time. Within 2 to 4 hours the number of leucocytes and the alkali reserve fall; there is a rapid increase in the leucocytes and a slower rise in the alkali reserve in the next 12 to 18 hours. (2) The initial lowering of the alkali reserve is accompanied by a sudden and transient increase in the percentage of blood-sugar; the rise in concentration of glucose reaches its maximum as the alkali reserve falls to its minimum. It then returns in 2 to 4 hours to a normal level, though the alkali reserve remains low. The glucose changes in blood are independent of the changes in the number of leucocytes.—W. E. G.

2728. Über die chemische Natur des bei der Luesreaktion nach Meinicke (D.M.) entstehenden Niederschlages. H. Lieb (*Zeit. physiol. Chem.*, 1921, **115**, 147-54).—The results of micro-analyses of the precipitate show it to be composed mainly of lipoids derived from the alcoholic extract of horses' heart used in the reaction. Small amounts of cholesterol and adsorbed protein are also present.—H. W. D.

2729. Über "Auto-noxine." W. A. Collier (*Berlin. klin. Woch.*, 1921, **58**, 478-9).—An auto-noxin is a substance which, though harmful to the body, originates in the body. They are thought to originate from auto-noxinogens.—W. D. H.

2730. Outbreak of Malaria by Injection of Human Serum. H. v. Dyk (*Ned. T. v. Gen.*, 1920, **64**, 1181-4).—Injection of serum from convalescents from malaria led to transmission of the disease in Servia and the Dutch East Indies. The author also utters a warning on the possibility of transmission of syphilis and tuberculosis by serum therapy.—R. B.

2731. Note sur la réaction de Hecht dans la grossesse. M. Watrin (*Compt. rend. soc. belge de biol.*, 1921, 264-5).—Cette réaction facile est toujours utilisable avec le sérum gravide. Par contre le sang fœtal (du cordon) ne contient pas de sensibilisatrice, mais du complément; il ne posséde pas de ferment placentalique; son pouvoir antitrypsique est inférieur à celui de la mère, de même que sa teneur en cholestérine.—E. Z.

2732. Action du sérum antiplaquettique sur les effets toxiques du sérum traité par l'agar. E. Zunz et P. Govaerts (*Compt. rend. soc. belge de biol.*, 1921, 243-5).—L'injection intrapéritonéale de sérum antiplaquettique faite 24 heures auparavant atténue légèrement les effets nocifs pour le cobaye de l'introduction de sérum traité par l'agar.—E. Z.

2733. Au sujet de la nature du bactériophage. R. Bruynoghe (*Compt. rend. soc. belge de biol.*, June 25, 1921).—Le mécanisme d'action du principe bactériophage nous est encore inconnu. L'auteur fait observér que l'adaptation et spécialisation que les bactériophages peuvent acquérir par symbiose avec les divers microbes aptes à subir son action plaide en faveur de la conception de d'Hérelle. Il en est de même de l'absence de spécificité du ferment.—E. Z.

2734. L'agglutination plasmatique, facteur d'instabilité des particules introduites dans la circulation. P. Govaerts (*Compt. rend. soc. belge de biol.*, 1921, 244-5).—En étudiant l'élimination d'encres de Chine introduites dans le sang circulant, l'auteur a constaté que certains de ces produits sont parfaitement stables dans le sérum de lapin, mais sont immédiatement agglutinés si on les ajoute à un plasma pur oxalaté à 1%. L'auteur pense, ayant observé le même phénomène avec le staphylocoque, que l'agglutination plasmatique peut intervenir dans l'élimination hors du sang des microbes introduits dans la circulation.—E. Z.

2735. Zur Kenntnis der Wirkung blanker Metalle auf Toxine. F. Erdstein and L. Fürth (*Biochem. Zeit.*, 1921, **118**, 256-8).—A confirmation of Baumgarten and Luger's results (*Wien. klin. Woch.*, 1917, 1222) that copper and to a very slight extent silver have a harmful effect on toxins. The authors consider that an actual destruction of the toxin takes place in the sense that a complex metal-toxin compound is formed.—H. K.

PLANT PHYSIOLOGY

CHEMICAL

2736. Über Nachweis und Lokalisierung, Verbreitung und Bedeutung der Oxalsäure im Pflanzenorganismus. N. Patschovsky (*Beih. z. bot. Centr.*, 1920, Abt. 1, **37**, 259-380).—The distribution of oxalic acid in plants was examined by the use of FeSO as

a reagent. The following methods of experimentation were employed: (1) Treatment of fresh sections with the reagent under the microscope; (2) injection of the reagent into the plant by the use of an air-pump; (3) treatment with the reagent in the warm. The precipitate which the reagent gives with tannin is readily distinguishable from that given with oxalate. The results of the research are recorded in detail.—W. S.

2737. The Composition of the Rhizomes of Bracken and its Variations. J. Henrick (*Bull. Roy. Bot. Gard. Kew*, 1921, 157-66).—Gives chemical analyses of the rhizomes of *Pteridium aquilinum* taken from 2 situations on the experimental farm of the N. of Scotland College of Agriculture. A marked difference in the nitrogen content of the 2 samples was demonstrated.—C. W.

2738. Commercial Utilisation of Waste Seed from the Tomato Pulping Industry. J. H. Shrader and F. Rabak (U.S. Dept. Agric., *Bull.* **927,** 1921, 1-29).—Gives chemical analyses for tomato-seed meal, cotton-seed meal, etc.—C. W.

2739. Composition of Normal and Mottled Citrus Leaves. W. P. Kelley and A. B. Cummins (*J. Agric. Res.*, 1920, **20,** 161-91).—Mottled citrus leaves contain less Ca and more K and P, and usually the N content is abnormally high. The cause of the low Ca content is uncertain.—V. H. B.

2740. Zur Kenntnis der Rolle der Pflanzenglykoside. R. Wasicky (*Biochem. Zeit.*, 1921, **113,** 1-18).—The author estimated glucoside present in leaves of digitalis at different times by poisonous effect of measured doses injected into frogs. After the sugar is split off the glucoside is much less toxic. He finds that the amount of glucoside in the leaf increases in sunlight and diminishes on shading, owing to the action of an hydrolytic enzyme. He assumes that the same enzyme catalyses the formation of glucoside, for the sugar concentration increases with photosynthesis. Both formation and hydrolysis of glucoside proceed in the vacuole of the cell, and the author suggests its formation and subsequent hydrolysis may play a rôle in regulating turgor pressure of the cell.—J. H. P.

2741. Über die Mikrochemie der Chitosanverbindungen. H. Brunswik (*Biochem. Zeit.*, 1921, **113,** 111-24).—In addition to the reaction of chitosan with iodine and dilute sulphuric acid, its staining properties with certain aniline dyes (Congo red, acid fuchsin, orange G, aniline blue, and water-soluble nigrosin), and also the crystalline salts obtained with strong (50%) nitric acid or 10% sulphuric acid, may be used as the microchemical tests for chitosan. Chitosan is prepared as usual by heating the chitin-containing preparation at 160° C. in 50% aqueous potash.—J. H. P.

2742. Über die chemischen Bestandteile grüner Pflanzen. H. Franzen, A. Wagner, and A. Schneider (*Biochem. Zeit.*, 1921, **116,** 208-14).—One kilo of finely minced plant material was mixed with water, and steam distilled to remove volatile non-toxic substances. The residue was shaken up with baryta water until weakly alkaline and volatile bases steam distilled, the distillate being titrated with $\frac{N}{10}$ HCl. Of 28 different plants investigated, all yielded some volatile bases, in most cases mainly ammonia; so that some easily decomposed ammonium compound appears to be a normal constituent of the green plant.—J. H. P.

2743. Über die Beeinflussung der Hitzekoagulation des Pflanzenprotoplasmas durch Neutralsalze. H. Kahno (*Biochem. Zeit.*, 1921, **117,** 87-95).—Observations upon lower epidermis of *Tradescantia zebrina* exposed to rising temperature when plasmolysed in solutions of neutral salts from 0·2 *N* to 0·8 *N* concentration. Heat coagulation detected by sudden loss of contents and consequent shrinkage of protoplast, which was previously gradually swelling in size with rising temperature. Anions fall into the usual lyotropic series in their influence in accelerating coagulation, which thus occurs at lower temperature. Thus $CNS > Br > I > NO_3 > Cl >$ tartrate $> CH_3COO >$ citrate $> SO_4$. Kations fall

into following series: $K,NH_4 > Na$, Li, Ca ?, > Mg, Ba, Sr. The first 5 members of latter series accelerate coagulation; Mg, Ba, and Sr are without influence, or even slightly hinder coagulation. Those salts which accelerate heat coagulation appear to do so in proportion to the ease with which they diffuse into the protoplast; the most marked effect in lowering the temperature of coagulation is produced by the salt diffusing inward most rapidly.—J. H. P.

ENZYME ACTION

2744. Die Entbehrlichkeit des Mangans für das Oxydasenmolekül bei der Züchtung von Hedera helix, und die Bertrandsche Mangantheorie der Oxydasen. A. W. v. d. Haar (*Biochem. Zeit.*, 1921, **113,** 19-28).—The author had previously concluded that purified peroxidase obtained from leaves of *Hedera helix* contained no Mn, whilst possessing active oxidising properties. He now shows that ivy seedling, grown from seed (containing only $\frac{1}{1000}$ mg. Mn) in Mn free culture solutions, gave normal growth and normally active peroxidase. The author considers that this peroxidase is of the nature of a gluco-protein.—J. H. P.

2745. Quelques corollaires des lois de l'hydrolyse diastatique. H. Colin (*Bull. soc. chim. biol.*, 1921, **3,** 263-72).—From the mathematical laws relating the concentration of sugar and diastase to the rate of enzyme action, it is possible to calculate (1) the degree of purity of certain polyoses (raffinose, gentianose, synanthrine, etc.), (2) the quantity of enzyme, and (3) the molecular weights of certain polysaccharides. Examples illustrating these corollaries to the law of diastastic hydrolysis are given in the paper.—W. S.

2746. Über die Gärwirkung maltasearmer Hefen—IV. R. Willstätter and W. Steibelt (*Zeit. physiol. Chem.*, 1921, **115,** 211-34).—Invertase and maltase are two distinct enzymes. It is possible that saccharase, maltase, α-glucosidase, lactase, melibiase, raffinase, and other sugar-splitting enzymes may exist in separate enzyme molecules built up on the same basal substance. They may be compared to keys having identical shafts and different wards. Another view is that the basal substance may carry 2 or more specifically active groupings; the simplest example of this type would correspond to a key shaft bearing 2 different wards, one at each end of the shaft. Comparisons of the invertase and maltase content of brewery and distillery yeasts showed that while the former contained suitable enzymes in large quantities, the latter revealed a remarkable lack of maltase. Maltose can be *directly* fermented without previous inversion, and, as a matter of fact, both direct and indirect fermentation of maltose occur at the same time. The nature and content of these specific enzymes in yeasts seem to be definite characteristics of the different varieties.—H. W. D.

VEGETATIVE DEVELOPMENT

2747. Growing and Feeding Sunflowers in Montana. A. Atkinson and J. B. Nelson (Univ. Montana Agric. Exp. Stat., *Bull.* **131,** 1919, 1-29).—This paper gives the results of tests of methods of growing sunflowers as carried out at the station.—C. W.

2748. The Relation of Salt Proportions and Concentrations to the Growth of Young Wheat Plants in Nutrient Solutions containing a Chloride. S. F. Trelease (*Philippine J. Sci.*, 1920, **17,** 527-603).—This paper presents a mass of experimental data obtained as the result of a study of the physiological influence upon plants of considerable amounts of KCl in a nutrient solution that also contains other salts supplying all the essential

elements. It appears that the growth of wheat plants for 24 days was nearly the same, whether a nutrient solution containing (*a*) Tottingham's 4 salts, (*b*) Shive's 3 salts, or (*c*) the latter with KCl was employed, provided the set of salt proportions giving the best growth was selected in each case.—C. W.

2749. Interperiodic Correlation in the Analysis of Growth. J. A. Harris and H. S. Reed (*Biol. Bull.*, Woods Hole, Mass., 1921, **40,** 243-58).—It is shown that in the case of a series of *Helianthus* plants the actual size of the individual at any stage of development is closely correlated with its size at other closely associated stages of development. The magnitude of the correlation rapidly diminishes as the growth stages become more widely separated in time. Thus the final size of the organism is but to a slight extent determined by its initial size.—C. W.

2750. Certain Effects under Irrigation of Copper Compounds upon Crops. R. H. Forbes (Arizona Agric. Exp. Stat., *Bull.* **80,** 1916, 145-238).—Individual plants grown in water cultures or in soil containing Cu show a comparatively small, and probably not injurious, accumulation of Cu in the aerial parts of the plants; but the root systems, carefully cleansed of externally adhering Cu, contain relatively large amounts. Cu in root systems, as shown by the biuret test, is largely in combination with plant proteins, especially at the growing points of root systems. Conditions favouring toxicity of Cu compounds are the presence of CO_2 and certain soluble salts which assist in forming Cu solutions which come into contact with the plant roots.—C. W.

2751. Über die Mobilisation der Aschenbestandteile und des Stickstoffs in Zweigen beim fruhjahrlichen Austreiben. A. Rippel (*Biochem. Zeit.*, 1921, **113,** 125-44).—One-year twigs of *Salix fragilis* were analysed quantitatively for mineral constituents and nitrogen before and after buds have germinated when twigs grown in pure water. K, P, Mg, Na, and N are withdrawn from axis by growing buds; Ca, Cl, and S are not appreciably withdrawn. In the developing twigs a deficiency in N and mineral substances has developed at a time when carbohydrates are abundant. All the mobilisable elements are present originally in organic linkages. The impossibility of withdrawing Ca from the stem causes the developing buds to show every symptom shown by developing seedlings when Ca supplies are deficient.—J. H. P.

2752. Ein neuer Fall von tagesperiodischen Rhytmus. M. G. Stålfelt (*Svensk bot. Tidsk.*, 1920, **14,** 186-9).—In plants of a pure line of *Pisum sativum* ("Concordia" of Svalov) the intensity of cell division in the root showed a maximum at about 9 to 11 a.m. and a minimum at about 9 to 11 p.m.—W. S. (*Ber. ü. d. ges. Physiol.*).

2753. Sur la loi d'accroissement de certaines cellules végétales. A. Gurwitsch (*Compt. rend. soc. biol.*, 1920, **83,** 1550-1).—In allium roots it is possible to obtain rows of 50 to 60 cells which develop from one mother cell. If the cells are numbered from the apex of the root towards the base, and a curve plotted between these numbers and the length of the cells corresponding to these numbers, a curve is obtained which is approximately represented by the equation $y=S+e^{ax}$, where y is the length of the xth cell from the apex.—W. S.

GROWTH OF LOWER PLANTS

2754. Bacteriologische onderzoekingen over zoogenaamde Yoghurtplantjes en Kefirkorrels. J. Boersma (*Med. v. d. Rijksseruminrichting*, Rotterdam, 1918, **1,** 344-73).—A review of literature and a report of some original investigations from which the following conclusions are drawn: (1) So-called yoghurt plants are genuine kefir granules; (2) the kefir granules are formed by *Lacto-bacillus caucasicus B;* (3) all other organisms found in kefir granules must be regarded as artificial contaminations; (4) the only thorough examination of kefir granules is that of Beijerinck.—W. S. (*Abstr. Bacteriol.*).

2755. The Production of Hydrocyanic Acid by B. pyocyaneus. F. A. Patty (*J. Inf. Dis.*, 1921, **29,** 73-7).—The optimum conditions for the production of HCN are given.—W. E. G.

CROP YIELD

2756. Permanence of Differences in the Plots of an Experimental Field. J. A. Harris and C. S. Scofield (*J. Agric. Res.*, 1920, **20,** 335-56).—A study of the correlations between the yields of 46 plots (each 0·17 acre) during the years 1911-19 show that even plots of small size and apparent uniformity are characterised by differences which may persist throughout a period of years. The residual influence of the variation in the yield of alfalfa upon the yield of subsequent crops could be demonstrated.—V. H. B.

2757. Variability of the Camphor Yield in Cinnamomum camphora. S. T. Dunn (*Bull. Roy. Bot. Gard. Kew*, 1921, 129-35).—A discussion of the causes of variation in the yield of camphor by *Cinnamomum camphora*.—C. W.

IRRITABILITY

2758. The Hydrion Differentiation Theory of Geotropism: A Reply to Some Criticisms. J. Small (*New Phyt.*, 1921, **20,** 73-81).—A reply to the criticisms of V. H. Blackman (see Abstract No. 2016, Vol. VI., p. 290).—W. S.

FLOWER AND FRUIT DEVELOPMENT

2759. Zur Kenntnis der Fertilität und partiellen Sterilität des Pollens bei Apfel- und Birnesorten. R. Florin (*Acta Horti Bergiani*, 1920, **7,** 1-39).—Records percentages of fertility and sterility of pollen in a number of varieties of apples and pears.—W. S. (*Ber. ü. d. ges. Physiol.*).

2760. Changes in Florida Grape Fruit in Storage. L. A. Hawkins and J. R. Magness (*J. Agric. Res.*, 1920, **20,** 357-73).—The acid content decreases in cold storage, and there is an apparent increase in sugar content which seems to be due to loss of water. The shrinkage of the fruit is 5 to 8% in cold storage, and 23% in warm ventilated storage. The best storage temperature is 32° F.; at temperatures of 40° F. and below the peel breaks down, producing a "pitting" of the fruit, but this is very slight at 32° F.—V. H. B.

2761. The Changes taking Place during the Ripening of Bananas. F. E. Lloyd (*Fruit Dispatch*, 1920, **6,** 76-86).—A general summary of our present knowledge of the subject.—C. W.

2762. Storage of Perishable Fruits at Freezing Temperatures. W. V. Cruess, E. L. Overholser, and S. A. Bjarnason (Univ. California Agric. Exp. Stat., *Bull.* **324,** 1920, 26-43).—Soft fruits such as apricots, cherries, and berries can be preserved at cold storage temperatures of 32° F. for not more than 1 to 3 weeks.—C. W.

ENVIRONMENTAL FACTORS

2763. Cold Resistance in Spineless Cacti. J. C. T. Uphof (Arizona Agric. Exp. Stat., *Bull.* **79,** 1916, 119-44).—It is shown that the species of spineless cacti having relatively thick integuments are more resistant to low temperatures than those having somewhat thinner integuments. The freezing-point of the cell sap of the cactus plant is very little below 0° C. This suggests that the soluble substances in the cell sap of cacti are very diffuse. The ordinary cactus contains as much as 90% water. The collecting and freezing in the intercellular spaces of the water from the cells is not in itself particularly harmful to the plant. Neither is the protoplasm injured with the concentration of the cell-sap solution as a result of at least a part of the water being withdrawn and frozen.—C. W.

2764. Relation of Weather to Crops and Varieties adapted to Arizona Conditions. A. J. McClatchie, J. E. Coit, *et al.* (Arizona Agric. Exp. Stat., *Bull.* **78,** 1916, 45-118).—Mentions the general effects of temperature, direct sunshine, and rainfall.—C. W.

2765. Growth in Eriogonum nudum in Relation to Environmental Factors. F. E. Lloyd (*Trans. Roy. Canadian Inst.*, 1921, **13,** 211-44).—Gives the results of growth experiments carried out at Carmel, California, with the terminal long internodes of a rosette plant, *Eriogonum nudum.* It was found that within the limits available under the experimental conditions the temperatures were not limiting if the humidity were sufficiently high. Growth rates could be increased by the removal of leaves, or reduced by the removal of conducting tissues.—C. W.

THE SOIL

2766. L'acide phosphorique dans les sols sableux humifères et dans leurs dissolutions. C. Brioux (*Ann. sci. agron. franc. et étrang.*, 1920, **37,** 80-6).—The opinion of Dumont that the concentration of P_2O_5 in the soil moisture depends on the humus substances is confirmed.—W. S. (*Ber. ü. d. ges. Physiol.*).

2767. Die Zuckerrübe als Bodenanalysatorin. D. F. Münter (*Biedermann's Zentr.*, 1920, **49,** 460-2).—The dry matter of the sugar beet was used as an indicator of the phosphoric acid condition of the soil. Besides the percentage of PO_4, that of N and K was also determined.—W. S. (*Ber. ü. d. ges. Physiol.*).

2768. Effect of Season and Crop Growth on the Physical State of the Soil. D. R. Hoagland and J. C. Martin (*J. Agric. Res.*, 1920, **20,** 397-404).—The physical state of the soil constituents is markedly affected by the concentration of the soil solution. A large increase of colloidal matter (as measured by turbidity) is associated with the depletion of the soil solution (as measured by its electrical conductivity) as a result of absorption of solutes by the plant. In questions of soil fertility the system soil, soil solution, and plant must be considered as a whole.—V. H. B.

PATHOLOGY

2769. Cause of Lime-induced Chlorosis and Availability of Iron in the Soil. P. L. Gile and J. O. Carrero (*J. Agric. Res.*, 1920, **20,** 33-61).—Addition of carbonate of lime to soils which bear normal calcifuge plants causes the plants borne on such soils to become chlorotic. Ash analysis of the plants indicates that the chlorosis is mainly due to a deficiency of iron, with an excess of lime as a possible contributory cause. The plants can recover on the application of iron salts, but organic compounds of iron were insufficient sources of iron for rice in calcareous soils. Rice which becomes chlorotic with ordinary calcareous soil will grow normally when such soil is submerged.—V. H. B.

2770. Injury to Seed Wheat resulting from Drying after Disinfection with Formaldehyde. A. M. Hurd (*J. Agric. Res.*, 1920, **20,** 209-44).—Wheat grains are not injured by soaking in a 0·1 or 0·2% solution of formaldehyde, but if the seed is dried without previous washing in water and without thorough aeration it may be severely injured. The injury is apparently due to the formation of paraformaldehyde.—V. H. B.

2771. Mosaic Disease of Potatoes. A. D. Cotton (*J. Min. Agric.*, 1921, **28,** 335-40).—A general account of the so-called mosaic disease of potatoes. Measures of control are suggested.—C. W.

2772. Studies in Bacteriosis. V. Further Investigations of a Suggested Bacteriolytic Action in Protea cynaroïdes affected with the Leaf-Spot Disease. S. G. Paine and E. M. Berridge (*Ann. Appl. Biol.*, 1921, **8,** 20-6).—Experiments negatived the hypothesis of the production by the cells of *Protea cynaroïdes* of a bacteriolysin against the organism which causes the so-called " leaf-spot " disease.—C. W.

2773. The Killing of Botrytis Spores by Phenol. J. H. Smith (*Ann. Appl. Biol.*, 1921, **8**, 27-50).—The author shows that if *Botrytis* spores are exposed to the action of 0·4% phenol the spores do not all die simultaneously, but some die in a few minutes, and some not till 2 or 3 hours have elapsed. The curve showing the numbers surviving at different times has a sigmoid shape. If the strength of the phenol is progressively raised the curve becomes less and less sigmoid, approaching the logarithmic type. With the same suspension it is possible to obtain either a logarithmic or a sigmoid curve according to the strength of phenol used.—C. W.

BOOK REVIEWS

Rôle des colloides chez les êtres vivants. By Auguste Luimère. Pp. 311. Paris: Masson et Cie, 1921. Price 16 fr.

The title of this book is somewhat misleading. Nearly nine-tenths is occupied with pathological questions, chiefly with anaphylactic shock. It is concerned mainly with the discussion of a theory put forward by the author that all disease is due to flocculation of the colloids of the body. Although criticism is to some extent disarmed by the admission that this theory is at present unproved, and it is all to the good to have the phenomena explained from a more or less novel point of view, the author would have been well advised to make a less sweeping claim. It is doubtless true that vital phenomena occur in heterogeneous colloidal systems. But there are many things requiring consideration in addition to the results of changes in aggregation of colloidal solutions. A useful bibliography is appended, and there are some well-executed coloured plates.—W. M. B.

Biochemistry: A Study of the Origin, Reactions, and Equilibria of Living Matter. By B. Moore, F.R.S., Oxford. Pp. 346. London: Edward Arnold, 1921. Price 21s. net.

Principles of Biochemistry. By T. Brailsford Robertson. Pp. 645. Adelaide, Philadelphia, and New York: Lea and Febiger, 1920. Price 6 dollars.

Both books are highly speculative. Professor Moore's is largely a reprint of his former papers on biotic energy and the like, and is an interesting attempt to deal with the origin of life. Professor Robertson's runs on the more usual lines. I have had reason to criticise it on account of its inaccuracies. See more fully reviews of both books in *Brit. Med. J.*, 1921, ii. 116.—W. D. H.

Analyses and Energy Values of Foods. By R. H. A. Plimmer. Pp. 255. H.M. Stationery Office, 1921. Price 6s. net.

About 900 analyses are given in tabular form, showing the composition and energy values of common foodstuffs sold and consumed in this country. The data given, which supplement those of Atwater and Bryant for American foods, will furnish fundamental facts for the construction and analysis of dietaries in use in Great Britain.—C. L. E.

Chemie den Enzyme. By H. Euler. Second Edition. I. Teil. Allgemeine Chemie der Enzyme. Pp. 306. J. F. Bergman, 1920. Price about 13s.

This edition is to appear in 2 volumes. This first volume deals with the preparation, purification, and general properties of enzymes, dynamics of enzyme action and catalysis, etc.—C. L. E.

The Microtomist's Vade-Mecum. By Arthur Bolles Lee. Eighth Edition, edited by J. Bronté Gatenby. Pp. 594. London: J. and A. Churchill, 1921. Price 28s. net.

The eighth edition of this well-known book has been so extensively revised by Dr. Gatenby as to be a practically new one. It is a volume no worker with the microscope

can afford to do without, whether he be anatomist, physiologist, cytologist, or pathologist. It is a mine of information in reference to methods, and contains much useful information of other kinds. The insertion of full bibliographical details make it a standard work of reference. Dr. Gatenby has been fortunate in his collaborators. Professor Bayliss has written the chapter on staining, a physical process of the nature of adsorption on which his special knowledge enables him to speak with authority. Chemical combinations are rarely, if ever, present in histological work. Dr. A. Drew, of the Imperial Cancer Research Fund, has rewritten the section on protozoa, while Dr. W. Cramer, of the same laboratory, writes on fatty substances, an important chapter in micro-chemistry. Mr. J. Thornton Carter is responsible for tooth and bone, and Dr. da Fano for the long and important portion of the book which deals with the nervous system. I have had the opportunity of seeing these chapters grow under Dr. da Fano's guidance, and can testify to the meticulous care he has taken in making his methods, statements, and last, but not least, his references, correct. The editor himself has written or revised the rest of the book, including special sections dealing with chromatin, chromosomes, glycogen, iron, yolk, mitochondria, Golgi apparatus, embryological methods, and tissue culture *in vitro*. His other numerous helpers I must leave to the preface, where they are mentioned and thanked. The original author, Dr. Bolles Lee, sent his blessing and 300 references. Sufficient has been said to indicate the high value of this really great undertaking.—W. D. H.

Précis de microscopie. By M. Langeron. Third Edition. Pp. 916. Paris: Masson et Cie, 1921, Price 34 fr.

A useful handbook of general microscopy.—C. L. E.

Japan Medical World. Vol. I., No. 1, May, 1921. Edited by Dr. K. Miyajima. Nippon No-Ikai Sha., Kanda. Price per ann., 12 yen.

The appearance of this new journal, which is published in English, is notified in the *Lancet*. From the list of contents the papers are mainly clinical, but from it I note the 2 following, which are of physiological interest: "Intermediate Metabolism," by Y. Kotake; "Structure of the Nucleus," by O. Tamura.—W. D. H.

OBITUARY

G. GALEOTTI

Galeotti died in Naples so suddenly on April 5 that his many friends, admirers, and pupils heard of his death before his illness. Born in Gubbio in 1867, he obtained his M.D. degree at the University of Florence when only twenty-three years of age. Seven years later he was Professor of General Pathology at the University of Cagliari. From there he went to Siena and then to Naples, where his indefatigable activity continued for another eighteen years, almost up to the very last days of his life. His thirty years' work extended over a wide range of subjects. He was one of the first to study the action of bacterial nucleo-proteins, and he was better known to physiologists for his investigations on cell division, the physiopathology of muscles, insensible perspiration, deglutition, electric resistance and conductivity of tissues in general, but chiefly of heart muscles and nerves. During the war he so entirely put himself at the service of his country that he fell ill, and fears were then entertained for the life now ended.—C. d. F.

H. K. LEWIS & CO. LTD., 28, GOWER PLACE, LONDON, W.C. 1

VOL. VI., NOS. 7 AND 8. OCTOBER AND NOVEMBER, 1921.

PHYSIOLOGICAL ABSTRACTS

GENERAL

2774. Aims and Boundaries of Physiology. Sir W. M. Fletcher (*Lancet*, 1921, ii., 541-3).—An abridged report of the address the author delivered as President of the Section of Physiology, British Assoc. meeting at Edinburgh. In addition to an admirable account of recent history and progress, the lecturer especially dwelt on the future and the importance of synthetic conceptions (*i.e.*, to regard the organism as a whole), and also the part which physiology should take in other sciences than that of medicine. —W. D. H.

2775. Evolutionary Wounds. A. Keith (*Brit. Med. J.*, 1921, ii., 137-9).—In this, the Popular Lecture at the B.M.A. meeting, the lecturer holds that the power to heal or repair is not a gift merely to enable man and beast to overcome the accidents of life; it has been given to living tissues from the very beginning of organised life. Because of this virtue it has been possible for Nature, in the course of evolution, to create gaping embryological wounds and to heal them. The processes which the surgeon sees at work in healing wounds are the same as those with which students of embryology are familiar. Examples of such are the closure of the clefts during the development of the upper lip, and the conversion of the neural plate into the neural tube. A cicatrix seldom remains to mark the site of an embryological wound; exceptions are the perineal raphe and the umbilicus. The lecturer describes the formation of these structures. Finally, he emphasises the wonder of this gift of healing.—D. H. de S.

2776. Ruhestrom und Durchlässigkeit. I. Untersuchungen mit Farbstoffen. J. Vorschütz (*Pflüger's Arch.*, 1921, **189,** 181-98).—It was shown by Beutner ("Die Entstehung elektrischer Ströme in lebenden Geweben und ihre künstliche Nachahmung durch synthetische organische Substanzen," *Monograph publ., F. Enke, Stuttgart*, 1920) that if 2 saline solutions of different composition are separated by a fluid which is immiscible with water, an electrical potential dependent on the solubilities of the ions on the two sides in the insoluble phase is established. This suggests a connection between permeability of cells and current of rest on the basis of distribution of ions in a lipoid phase. The hypothesis was tested by studying the effect of acid and basic dyestuffs on the rest-current of muscle. All the basic dyes tested were lipoid-soluble, and all produced an electro-negative condition in the muscle, but this might have been due to injury; they accelerate sedimentation and agglutination of blood-corpuscles, which is also an indication of structural alteration. Some acid dyes engender an electro-negative condition, and these also injure the tissue. But 3 out of the 34 acid dyes examined caused an electro-positive state, and were also lipoid-soluble. These effects, when allowance is made for injury, lend some support to Beutner's theory that the boundary between "oil" phase and a solution with an organic cation becomes negative, while if the anion is organic the boundary becomes positive. Echtrot A and B were 2 acid dyes producing positivity, soluble in lipoids, and not causing injury to the tissue.—C. L. E.

2777. The Effect of Short Spells of Rest on Physical Efficiency as Measured by a Bicycle Ergometer. Lucy A. Wallrich and P. M. Dawson (*Amer. J. Physiol.*, 1921, **56,** 460-3).—When exercise is heavy, efficiency is increased; when it is light, the opposite.

The neutral point varies with the individual, and in the same individual with practice and physical condition.—W. M. B.

2778. The Photic Reactions of Tadpoles in Relation to the Bunsen-Roscoe Law. V. Obreshkove (*J. Exp. Zool.*, 1921, **34,** No. 2).—Tapdoles of *Rana clamitans* which have been in the dark, when suddenly illuminated by light of sufficient strength, give a quick forward movement. The time which elapses between the stimulus and the response varies with the intensity of light. Because of this definite relation, it is assumed that a photochemical substance is present in the photoreceptors. The ratio of the extremes of intensities used was 1 : 500; the sensitivity of the eye is compared with that of the skin. The changes taking place in the photoreceptors proceed according to the Bunsen-Roscoe law.—W. D. H. (*W. I.*).

2779. Resistance of the Vinegar Eel to Various Agents. N. Passerini (*Staz. sper. agr. italiane*, 1921, **54,** 15-64).—The author has investigated the action of a number of chemical compounds and of physical conditions on the vinegar eel, which shows pronounced resistivity towards even energetic reagents.—W. D. H. (*J. C. Soc.*).

2780. Adaptation—IV. W. J. Crozier (*Biol. Bull.*, 1921, **41,** No. 2).—*Ogilbia verrillii*, a shore-living brotulid and close relative of the blind fishes of the Cuban caves, has relatively small eyes and is photonegative. Its skin is sensitive to light, a condition thus far recognised in but one other marine fish; this is taken to be of significance for the conception of preadaptation.—W. D. H. (*W. I.*).

For further papers on Adaptation see under Physiology of Invertebrates.

APPARATUS AND METHODS

2781. Exposure of the Dog's Ciliary Ganglion. A. R. Cooper and J. T. Groot (*J. Lab. and Clin. Med.*, 1921, **6,** 639-42).—A detailed description of the technique.—W. D. H.

2782. Device for Demonstrating Heart Block. N. B. Eddy (*J. Lab. and Clin. Med.*, 1921, **6,** 635-9).—A simple arrangement of a wire snare to take the place of Gaskell's clamp in students' work on the frog's heart.—W. D. H.

2783. Technique of the Vividiffusion Method of Abel. H. C. van der Heyde and W. M. Morgantown (*J. Lab. and Clin. Med.*, 1921, **6,** 520).—The modification, described in detail, is in the method of preparing the dialysing tubes.—D. H. de S.

2784. Alcuni esperimenti di scuola—II. G. Rossi and I. Spadolini (*Arch. di fisiol.*, 1921, **19,** 48-56).—For previous note see Abstract No. 2340, Vol. IV., p. 374. In the present paper they describe an ingenious apparatus for the demonstration of osmotic processes in single cells, and an electro-chemical method of graphic registration on continuous paper. Strips of the latter are damped with a 1 or 2% solution of KI to which some starch and glycerol are added. At the moment of use the strips are applied to a kymograph. This is connected with the negative pole of a constant current, while the writing pen, formed by a thin thread of copper or platinum, is connected with the positive pole.—C. d. F.

2785. Die Methoden zur Bestimmung des Mengeverhältnisses von Plasma und Blutkörperchen. H. J. Hamburger (*Med. Klinik*, 1921, No. **23,** reprint, pp. 7).—Five methods are described, and their advantages and drawbacks discussed. These are the hæmatocrit, chemical methods, specific gravity, electrical conductivity, and a colorimetric method. The first appears to have every advantage over the remainder.—C. L. E.

2786. Bestimmung von Niederschlägen auf mikrovolumetrischem Wege. H. J. Hamburger (*Abderhalden's Hdbch. d. biolog. Arbeitsmeth.*, Abt. I., Teil 3, pp. 855-70).—The principle of the method is that a precipitate thrown down by a suitable reagent

is centrifuged off, and its volume, relative to the volume of the whole fluid, measured in a specially calibrated capillary tube (chonohæmatocrit). Good results can only be obtained when a given amount of the substance yields a constant volume of precipitate, when n-times that amount gives n-times the volume of precipitate, and when the volume of the precipitate is not influenced by the presence of other substances in the fluid. It is further necessary, in order to obtain reliable results, that the size of the particles, and in the case of a crystalline precipitate that the form of the crystals, is uniform in all the estimations. If the precipitate under investigation is centrifuged at the same time as a standard precipitate, the speed of the centrifuge is of little importance. In the estimation of SO_4 the size of the granules is of great importance, and a constant size can only be got by a particular procedure.—C. L. E.

2787. Ein neues Viscostalagmometer zur Bestimmung der Oberflächenspannung und Reibung für Flussigkeiten von verschiedenster Reibung. J. Traube (*Biochem. Zeit.*, 1921, **120,** 106-7).—A description of a simple apparatus for measurements of surface tension and viscosity of liquids of very varying degrees of limpidity.—H. K.

2788. The Determination of Cresol by the Phenol Reagent of Folin and Denis. R. M. Chapin (*J. Biol. Chem.*, 1921, **47,** 309-14).—Different phenols require different factors, but by the use of prescribed empirical factors and by adhering to standard working conditions the cresols may be determined with fair accuracy.—H. E. R.

2789. Die elementaranalytische Methode der direkten Bestimmung von Kohlensäure und Sauerstoff in der Berthelotschen Bombe und ihre Bedeutung für Stoffwechselbilanzen speziell beim Herbivoren. W. Klein and M. Steuber (*Biochem. Zeit.*, 1921, **120,** 81-9).—The authors extend the work of Zuntz and co-workers on the use of the bomb-calorimeter for the analysis of organic substances, the main feature being the determination of the oxygen used. Full details are given.—H. K.

2790. Apparatus for Determining Gas Exchange in Man. I. Gas Mask. II. Sampling Bottle for Gas Analysis. C. V. Bailey (*J. Biol. Chem.*, 1921, **47,** 277-9, 281-3).—Description of pieces of apparatus, which must be read in the original with the drawings provided.—W. D. H.

2791. A Simple Laboratory Gas Meter and an Improved Haldane Gas Analysis Apparatus. H. S. Newcomer (*J. Biol. Chem.*, 1921, **47,** 489-94).—The meter is an adaptation of the common 5-light service meter, but the description, together with suggested improvements in the Haldane apparatus, must be read in the original with the diagrams provided.—W. D. H.

2792. Weitere Ausarbeitung der Indikatorenmethode ohne Puffer. L. Michaelis and R. Krüger (*Biochem. Zeit.*, 1921, **119,** 307-27).—The temperature coefficient and salt error of m-nitrophenol have been determined, and a new one-colour indicator, 2:5-dinitrophenol described. The variation in P_H produced by the indicator is dealt with practically and theoretically.—H. K.

2793. Remarques sur les dosages de sucre en biologie. M. Polonowski and E. Duhot (*Compt. rend. soc. biol.*, 1921, **85,** 501-3).—Sugar estimations in the blood and cerebrospinal fluid vary (1) according to the method of collecting the blood, (2) according to the method of preventing clotting and glycolysis, (3) according to the method of removing proteins, and (4) according to the method of estimation.—J. H. B.

2794. Micro-dosage manganimétrique du glucose sur un centimetre cube de sang ou de liquide céphalo-rachidien. G. Fontès and L. Thivolle (*Bull. de la soc. de sci. méd. de Montpelier*, 1921, **4,** 247-9).—The blood to be examined is deproteinised by the method of Folin and Wu; an alkaline copper solution is added, and the mixture heated to 100° for 6 minutes. The reduced copper is precipitated by the addition of $MgSO_4$ and Na_2CO_3; after centrifuging, to this copper precipitate is added ammonia molybdate and phosphoric acid. One then titrates with $KMnO_4$. A solution of glucose of known

strength is similarly treated. From the number of c.c. of permanganate used to discharge the blue colour in the unknown compared with the number required in the case of the standard one calculates the glucose in grammes per litre. The writers claim great accuracy for their method.—E. P.

2795. Kritisch-analytische Betrachtungen zur Bestimmung des Blutzuckers bei Gesunden und Kranken. W. Stepp (*Arch. exp. Path. Pharm.*, 1921, **90,** 105-28).—Reliable blood-sugar estimations are only obtained by polarimetric or fermentation measurements. Reduction methods give results from 20 to 100% too high.—J. H. B.

2796. Über die Verwendung der Pavy-Sahlischen Titrationsmethode zur klinischen Bestimmung des Blutzuckers in kleinen Blutmengen (0·1 c.c. Blut). S. H. Reist (*Schweiz. med. Woch.*, 1921, **51,** 419-23).—This simple method gives sufficiently exact results.—H. W.

2797. New Methods of Blood-Sugar Estimation. D. G. C. Tervaert (*Ned. T. v. Gen.*, 1921, **65,** 857).—The methods of Shaffer and Hartman, of Folin and Wu, and of Ponder and Howie are discussed. The first one is modified for small amounts of blood (0·2 c.c.); in the last a simplification is proposed. All 3 methods are warmly recommended.—R. B.

CHEMICAL

2798. Donnan Equilibrium and the Physical Properties of Proteins. III. Viscosity. J. Loeb (*J. Gen. Physiol.*, 1921, **3,** 827-41).—The viscosity varies with the H-ion concentration in the same way as do swelling, osmotic pressure, and electric charge. Egg albumin has a low viscosity independent of P_H. This relative behaviour is inconsistent with the view of hydration of the protein ion. The viscosity of suspensions of powdered gelatin is influenced by the H-ion in the same way as solutions of equal concentration. The volume occupied by the gelatin in the suspension varies with the viscosity as theory requires. The influence of P_H on the volume of the granules in suspension is due to a Donnan equilibrium between them and the solution.—W. M. B.

2799. The Rôle of the Activity Coefficient of the H-Ion in the Hydrolysis of Gelatin. J. H. Northrop (*J. Gen. Physiol.*, 1921, **3,** 715-42).—Hydrolysis of gelatin at constant H-ion concentration follows the unimolecular law for $\frac{1}{3}$ of its course only. If the P_H is not kept constant, the rate is in certain stages proportional to the square root of the time. In strongly acid solutions, P_H less than 2, the rate is proportional to the P_H as determined by the hydrogen electrode, not to the conductivity—*i.e.*, to the "activity." Neutral salts increase rate and "activity" to about the same extent. The rate in strongly alkaline solutions, P_H above 10, is directly proportional to the OH-ion concentration. The rate of hydrolysis between P_H 2 and 10 is nearly constant, and much greater than that calculated from the concentration of the 2 ions. It may be due to uncombined gelatin hydrolysing more rapidly than its salts.—W. M. B.

2800. Theory of Gels—III. S. C. Bradford (*Biochem. J.*, 1921, **15,** 553-62).—A further contribution to a subject of physical interest; evidence is adduced that the reversible sol-gel transformation of the natural emulsoids is an extreme case of crystallisation and solution. Specialists in the subject must consult the original for details.—W. D. H.

2801. Regulation of Osmotic Pressure. I. Effect of Increasing Concentrations of Gelatin on the Conductivity of Sodium Chloride Solution. W. W. Palmer, D. W. Atchley, and R. F. Loeb (*J. Gen. Physiol.*, 1921, **3,** 801-6).—Conductivity of pure gelatin increases with concentration, regardless of H-ion concentration. The addition of gelatin to 0·6% NaCl at P_H=3·3 causes increase of conductivity with each added increment of gelatin. At P_H=5·1 and 7·4 the conductivity decreases.—W. M. B.

2802. β-Oxidation and Paired Linkings. K. Spiro (*Helv. Chim. Acta*, 1921, **4**, 459-72).—The different course of oxidation suffered by acids with an even and uneven number of carbon atoms within the organism is shown in purely chemical observations, and is paralleled by physiological effects such as taste and smell (phenylbutyl and phenylhexyl alcohols have a slightly unpleasant odour, whereas phenylamyl and phenylheptyl alcohols have pleasant odours of lemons and roses respectively). Examination of physical constants—for example, melting-points of the fatty acids or hydrocarbons—shows that the substances with odd and even numbers of carbon atoms respectively form 2 independent series. This parallelism between melting-point (as characteristic of structure) and physiological behaviour extends even to details. The melting-points of the first members of both series are not typical, and do not conform to rule, the typical series commencing with the fourth or fifth member. The same is true of physiological behaviour; formic and acetic acids behave peculiarly in the organism, whilst propionic acid is oxidised to α- and not to β-hydroxypropionic acid. A general characteristic of the aliphatic series is obviously involved, which, however, may be masked by the presence of certain groups—for example, $—NH_2$. The regularities in homologous series (oscillation) cannot be recognised in the same manner with substituted or branched chains, and in these cases also β-oxidation is not observed in the organism. They are more frequently and more sharply observed with solid than with vaporised substances, which is explained by the effect of rise in temperature causing the loosening of intramolecular linkings; thus β-oxidation occurs at relatively low temperatures both within and without the organism, whilst at higher temperatures α-oxidation occurs. The widespread occurrence of paired linkings is further illustrated by von Weimarn's theory of colloids and by Karrer's recent work on the structure of the higher carbohydrates.—W. D. H. (*J. C. Soc.*).

2803. Prende l'acido sulfocianico qualche parte del funzionamento dell' organismo animale? E. Cavazzani (*Arch. di fisiol.*, 1920, **18**, 93-5).—Dezani obtained negative results concerning the function of sulphocyanic acid in the animal organism (Abstract No. 2456, Vol. V., p. 387). The present paper points out that nobody can, at all events, deny that in dilutions nearing the physiological ones sulphocyanic acid prevents the peptic digestion of fibrin.—C. d. F.

2804. Chrysalis Oil. S. Kawase, K. Suda, and A. Fukuzawa (*J. Chem. Soc. Japan*, 1921, **42**, 181-235).—The constituents and the physical and chemical properties of 4 kinds of chrysalis oil, and of an oil from the silkworm, have been investigated. The mixed fatty acids of the oil contain about 25% solid and 75% liquid acids. The solid acid consists of a small quantity of palmitic acid, with a large quantity of a new isomeric acid, isopalmitic acid. The liquid acid is composed of oleic, linoleic isolinoleic, and linolic acids. By hydrogenation of the chrysalis oil, using nickel as catalyst, the only solid acid produced is stearic acid. There is therefore no other acid than that containing 18 carbon atoms in the liquid acid.—W. D. H. (*J. C. Soc.*).

2805. Estimation of Cholesterol and Allied Substances. J. A. Gardner and M. Williams (*Biochem. J.*, 1921, **15**, 363-75).—An investigation to determine whether other sterols give colour reactions in such a way as to be comparable with cholesterol. Under definite conditions of acidity and temperature coprosterol can be estimated. ψ-coprosterol cannot, and when present interferes with estimations of cholesterol or coprosterol. Pure β-cholestanol probably gives no colour with acetic anhydride and sulphuric acid. Cholesteryl acetate, benzoate, and stearate give colours both in range and shade identical with cholesterol standard; quantitatively the results are high. Coprosteryl chloroacetate gives a green colour only on long standing. Application of this reaction to amorphous sterols from fæces gives unsatisfactory results. With ether extracts of tissues, animal fluids such as milk, and serum the digitonin method is accurate. With serum or blood the colorimetric method is satisfactory.—J. A. H.

2806. Error in the Colorimetric Estimation of Cholesterol in Tissue Fat. J. A. Gardner and F. W. Fox (*Biochem. J.*, 1921, **15,** 376-8).—Commercial non-methylated alcohol heated with caustic soda or potash and extracted with ether yields residue which gives a colour (brown or green) with acetic anhydride and sulphuric acid.—J. A. H.

2807. Is Glycogen the Source of Acids developed in Autolysis? W. Morse (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 246-7).—Ox liver was used for the experiments on autolysis. The results indicate that glycogen may be one of the precursors of substances concerned with the development of acidity.—D. H. de S.

2808. Quellung von Fibrin durch Säuren. R. Somogyi (*Biochem. Zeit.*, 1921, **120,** 103-5).—In general the swelling effect of acids on fibrin resembles the effect on gelatin, the acids following the same order of activity. The biologically important acids—hydrochloric, lactic, and formic—produce pronounced swelling.—H. K.

2809. Sulla cristallizzazione dell' emoglobina. G. Amantea and C. Krzyszowsky (*Arch. di fisiol.*, 1920, **18,** 87-92).—To prepare hæmoglobin crystals quickly the blood of *Vespertilio nettereri* appears more suitable than that of any other animal. At the time of hibernation crystals can be obtained by simply putting a drop of its blood on a slide under a coverslip and by letting it stand for a little while. The blood of other bats is not so suitable. The best general method for obtaining crystals is direct treatment on a slide of a drop of blood with a small quantity of powdered saponin. In animals with nucleated red cells one treats a drop of blood either with a small quantity of powdered gum arabic or with a drop of a mixture consisting of 1 c.c. of saturated aqueous solution of saponin, 1 drop of 10% ammonia, and 0·5 c.c. of ether. By the saponin method the crystals of hæmoglobin can be obtained from guinea-pigs' blood almost as quickly and easily as that of *V. nettereri*.—C. d. F.

2810. Oxygen Dissociation of Hæmoglobin and the Effect of Electrolytes. E. F. Adolph and R. M. Ferry (*J. Biol. Chem.*, 1921, **47,** 547-55).—A method is described for dialysing hæmoglobin depending on its protein property of acting as a dissociable electrolyte. It gives S-shaped curves for oxygen dissociations. Adding alkali forms an alkali hæmoglobinate, and this leads to an increase of oxygen found at a constant tension. Neutral salts even in small concentrations decrease the amount of oxygen found. Non-electrolytes do not affect oxygen equilibrium. The equilibrium between Hb and O_2 is a function of that between Hb and electrolytes.—W. D. H.

2811. Colorimetric Estimation of Carnosine. W. M. Clifford (*Biochem. J.*, 1921, **15,** 400-6).—The method is based on Koessler and Hanke's method for estimating pure solutions of iminazole compounds.—J. A. H.

2812. The Stability of Tryptophane in Baryta Hydrolysis. H. Onslow (*Biochem. J.*, 1921, **15,** 383-91).—Tryptophane is more stable to boiling acid when pure than when in combination. It is rapidly destroyed by all alkalis, NaOH being more effective than $Ba(OH)_2$. When caseinogen is hydrolysed by NaOH tryptophane is rapidly destroyed; with $Ba(OH)_2$ it is more stable. The destruction of tryptophane seems to depend on the presence of other products of hydrolysis, and may be prevented largely by addition of crystalline amino-acids. Histidine is fairly stable when boiled with baryta. In acid solutions it is not easily precipitated by $HgSO_4$ except in high concentrations. The total nitrogen of the $HgSO_4$ precipitate from hydrolysed caseinogen reaches a maximum in 60 to 70 hours. Gelatin and zein, after baryta hydrolysis, yield only traces of nitrogen in the $HgSO_4$ precipitate. Tryptophane may be recovered quantitatively.—J. A. H.

2813. Notes sur les dérivés de quelques acides aminés. L. Hugounenq and G. Florence (*Bull. soc. chim. biol.*, 1921, **3,** 283-5).—Purely chemical data on the action of some amino-acids, on chromium oxide, and on the hydrochlorides of glycine and aspartic acid are briefly described.—W. D. H.

2814. The Substances precipitated by Mercuric Sulphate from Hydrolysed Caseinogen. H. Onslow (*Biochem. J.*, 1921, **15,** 392-9).—The following acids were identified: leucine, cystine, tyrosine (traces), and other mono-amino acids; glutamic and aspartic acids, histidine and proline. The degree of hydrolysis affects the acids. Tyrosine does not separate quantitatively as early in hydrolysis as is sometimes assumed. Directions for obtaining tryptophane from caseinogen in yields of 1·7% are given.—J. A. H.

2815. Amino-acylcholine Esters. I. Glycylcholine. H. W. Dudley (*J. Chem. Soc.* 1921, **119-20,** 1156-60).—This paper, dealing with the preparation and properties of the first of a new series of compounds, is of purely chemical interest. Pharmacological actions will follow later. The present paper also contains a method for preparing choline itself in crystalline form.—W. D. H.

2816. The Acidity of the Hydrogen Atoms in Uric Acid. H. Biltz and Lisbeth Herrmann (*Ber. d. deutsch. chem. Ges.*, 1921, **54B,** 1676-94).—All 4 hydrogen atoms of uric acid are acidic, and can be replaced by metals, as is shown by the formation of salts from each of the 4 trimethyluric acids. Generally, however, uric acid behaves as a dibasic acid at most, and the precise situation of the replaceable hydrogen atoms has not been elucidated. This can be effected by measurement of the dissociation constants of the 4 trimethyluric acids. The results show that hydrogen atom 3 is the most acidic, and that the hydrogen salts result from its displacement by metal. Next in order is hydrogen atom 9, and the normal salts result from the displacement of these 2 atoms. Hydrogen atoms 1 and 7 are much weaker; their acidity is approximately equal, atom 7 being probably the weaker. The capacity of ionisation of the uric acids is not greatly influenced by the presence of methyl groups.—W. D. H. (*J. C. Soc.*).

2817. Nochmals die Wasserstoffionen. J. Traube (*Biochem. Zeit.*, 1921, **120,** 108-10).—The author's contention is that P_H is too much in the foreground, to the neglect of other factors.—H. K.

2818. Über Jodabspaltung aus Jodoform und dessen Ersatzpräparaten. C. Bachem and H. Kriens (*Biochem. Zeit.*, 1921, **120,** 230-49).—A number of iodoform substitutes containing iodine have been examined with reference to their stability towards water under varying conditions of lighting and temperature. The action of protein solutions was also examined. The results vary from substance to substance.—H. K.

2819. Oligodinamia Activacion del agua destilada por el cobre metalico y sus oxidos. H. Wernicke and A. Sordelli (*Ann. de la Asociac. Quim. Argent.*, 1921, **9,** No. 43, 145-82).—Résumé bibliographique très minutieux. Les auteurs démontrent que l'eau distillée ne dévient oligodynamiquement active en présence de Cu ou de ses oxides, que quand il y a dissolution du Cu. Celle ci ne se produit pas en atmosphère d'oxygène ou d'hydrogène; elle se produit en présence de ces gas ou de l'air quand il y a du CO_2 ou des ions H libres. L'action oligodynamique se produit vraisemblablement par adsorption.—B. A. H.

ENZYMES

2820. Particulate Nature of Enzymic and Zymic Change. H. E. Armstrong (Adrian Brown Memorial Lecture, *J. Inst. Brewing*, 1921, **27** [**18** new ser.], 197-260).—A most interesting account of Adrian Brown and of other chemists who have done so much to further the science of brewing. His work on diffusion (in connection with the barley grain) and on yeast and fermentative processes generally is told at full length, and the fascinating story of the yeast cell from the days of Huxley and Pasteur onwards is related. The scientific points urged are, that in many cases the curve of enzymic action is linear rather than logarithmic, and that enzymes are probably never in true

solution. The lecture contains much of interest to biochemists generally. *Inter alia,* the substitution of the word advitant for vitamin is urged.—W. D. H.

2821. Enzymes. VI. Protective Action of Starch and Other Substances on Ptyalin in Acid Media. D. Maestrini (*Atti R. Accad. Lincei,* 1921, [v.], **30,** i., 315-8; compare Abstract No. 1186, Vol. VI., p. 175).—The author has employed other substances to ascertain if any shares with starch the property of protecting saliva from the destructive action of HCl; 3 classes of substances are distinguished: (1) Egg-albumin dissolved in physiological salt solution and ox-blood fibrin exhibit no such property; (2) sweet almond oil, mutton fat, and egg-albumin dissolved in water cause the enzymic activity to be far less marked than with 5% starch paste; (3) animal charcoal exerts a protective action greatly exceeding that of starch. The action is probably due to simple adsorption of the enzyme.—W. D. H. (*J. C. Soc.*).

2822. Fermentstudien. VII. Die organische Komponente der Diastasen und das wahre Wesen der " Autolyse " der Stärke. W. Biedermann (*Fermentforsch.*, 1921, **4,** 359-96; see Abstract No. 2060, Vol. VI., p. 297).—An active amylase of saliva gave the reactions of an albumose. It has no effect in salt-free solutions, but needs certain salt ions to activate it. Plant and animal amylases are identical, any apparent differences being caused by the different composition of the solutions in which they occur. It can be proved indirectly that small amounts of amylase adhere to starch granules, and can, under the right conditions, effect an " autolysis." If saliva is heated, the diastatic power decreases with increasing coagulation of the proteins, but does not totally vanish. The diminution of the diastatic power of heated saliva depends not only upon the partial removal of the organic components, but also on a physical alteration of the inorganic complements, for these salts lose their activating power by heating. The " autolysis " of starch is not caused by a new formation of ferment from the substrate, but only by the activation of the remains of ferment.—H. W.

2823. Action of Sodium Oleate on Amylolytic Fermentation. T. Isawa (*Kyoto Igaku Zassi* [*J. Med. Soc. Kyoto*], 1921, **18,** 49-82).—The action of unsaturated fatty acids on amylolytic and proteolytic fermentation was investigated to find some connection between chemical action and immunity reactions. By the addition of a very small quantity of sodium oleate to a mixture of amylolytic enzyme (such as pancreatin, taka diastase, and serum diastase) and soluble starch, the action of the enzyme was inhibited distinctly, while peptic and tryptic fermentations are not influenced. Ovolecithin has no influence on the diastase-starch reaction. The retarding action of the oleate is diminished by adding a solution of Witte peptone or heated serum, which depends on the combination of protein or lipoid with the oleate, but not on the protecting property of destroying enzyme. The oleate combines with blood-corpuscles, serum protein, and peptone, but not with complement in serum by itself. When sodium oleate was previously added to amylase solution, amylolytic power was not altered; but when it was added first to starch solution, much more time was needed for complete digestion, compared with that of control experiments. The oleate, therefore, neither destroys nor inactivates the enzyme, but probably makes a loose union with soluble starch, producing comparatively large granules and rendering the enzyme action on it very feeble. In the retarding influence of any substance on enzyme action, there are 4 possibilities at least which should be distinguished: (1) Simple inactivation; (2) destruction of enzyme; (3) combination of both inactivation and destruction; and (4) combination of the substance with substrate, making fermentation difficult or impossible.—W. D. H. (*Chem. Abstr.*).

2824. Sensitiveness of Saccharase towards Ultra-violet Light and Oxidising Agents. O. Svanberg (*Arkiv Kem. Min. Geol.*, 1921, **8,** No. 6, 1-17).—A saccharase solution with a low proportion of dry matter is more sensitive to the radiation from a mercury lamp

than is one with a higher dry matter content, and the destruction of the enzyme by this means may be prevented by passing hydrogen through the solution while the ultra-violet light is acting on it. From these results the conclusion is drawn that this action of ultra-violet light is mostly a secondary photochemical effect. Agulhon's supposition that destruction is due to the formation of hydrogen peroxide is not justified, since the enzyme is highly insensitive towards the peroxide; it is, however, far more sensitive towards ozone, but not sufficiently so to furnish an explanation of the effect of ultra-violet light. These oxidising agents exert a far greater effect on amylase solutions, and the sensitiveness of this enzyme towards ozone is capable of explaining its destruction by ultra-violet light.—W. D. H. (*J. C. Soc.*).

2825. Lipase. I. Hydrolysis of Esters of Dicarboxylic Acids by Liver Lipase. A. A. Christman and H. B. Lewis (*J. Biol. Chem.*, 1921, **47**, 495-505).—Examining the acidity developed from diethyl esters of succinic and malonic acids, it is concluded that the reaction proceeds to an equilibrium corresponding to the removal of one ethyl group; mono-ethyl malonate was obtained from the products. This lipase was not able to cleave mono-ethyl malonate or potassium ethyl malonate. Ethyl propionate was hydrolysed by lipase in presence of the K salt of mono-ethyl malonate, but not in the presence of the mono-ethyl ester itself.—W. D. H.

2826. Über eine neue Funktion des tryptischen Fermentes (Anhydrase) und über die Darstellung von d-Tyrosinanhydrid und d-Tryptophananhydrid aus den tryptischen Verdauungsprodukten. S. Frankel and E. Feldsberg (*Biochem. Zeit.*, 1921, **120**, 218-29).—Casein, when digested with trypsin until the bromine test is negative, yields a dextrorotatory tyrosine anhydride and a dextrorotatory tryptophane anhydride. The amino groups are free, but the carboxyl groups are combined as in acetic anhydride. —H. K.

2827. Über die Spaltbarkeit von Polypeptiden durch Fermente, an deren Aufbau Aminosäuren beteiligt sind, die unter den Eiweissspaltproducten noch nicht aufgefunden wurden. E. Abderhalden and H. Kürten (*Fermentforsch.*, 1921, **4**, 327-37).—The authors investigated the question whether normal *a*-aminovaleric acid is a constituent of proteins. This compound (called "Norvalin" by the authors) and its salts and dipeptides (description of their characters are given) were mixed with the maceration juice of yeast. The *d*-norvalin compounds were split off by the yeast enzymes, but not the *l*-norvalin compounds. The investigation, such as splitting by ferments, can be used to distinguish whether an amino-compound exists in nature, or is only an artificial product.—H. W.

2828. Beitrag zur Frage des Einflusses der Structur und Konfiguration des Substrates (Polypeptide) auf die Fermentwirkung. E. Abderhalden and H. Handovsky (*Fermentforsch.*, 1921, **4**, 317-26).—The preparation of the compounds is first described. Yeast juice, which was able to split off the glycyl-*l*-leucine and the glycyl-*l*-leucyl-glycyl-*l*-leucine could not decompose glycyl-*d*-leucyl-glycyl-leucine. The celerity of the reaction depends on the concentration of the yeast juice.—H. W.

2829. Tyrosinase. H. Haehn (*Fermentforsch.*, 1921, **4**, 301-15).—Tyrosinase can be detected if it is decomposed into its two components (the thermolabile *a*-tyrosinase and a saline fraction or activator). The melanin, formed from the tyrosine by the tyrosinase is a colloid characterised by typical colour reactions. The tyrosinases obtained from potatoes, *Russula fragilis*, and the meal-worm (*Tenebrio molitor*) are identical. The saline component has a double action to activate the tyrosinase and to precipitate the melanin as a coloured colloid.—H. W.

2830. Studien über die Urease. S. Lövgren (*Biochem. Zeit.*, 1921, **119**, 215-93).—This paper contains a valuable bibliography of 212 papers, and is illustrated throughout by quotations from original papers. The author has carried out experiments covering a

wide range of properties of urease, but the main portion deals with an attempt to find the time equation which covers the reaction adequately. Van Slyke and Cullen's equation was found not to hold, but a simple, apparently empirical, modification of the monomolecular equation gave excellent results provided that at each concentration of urea the solution was kept at the particular optimum P_H.—H. K.

2831. Über Oxidationskatalysen—II. L. Karczag (*Biochem. Zeit.*, 1921, **119,** 16-22).—Experiments with dyes at high dilution show that the ferrous ion catalyses oxidation with hydrogen peroxide much faster than the ferric ion. The order of mixing is of influence, the controlling factor being whether the ferrous ion is first oxidised to ferric or not.—H. K.

2832. The Catalase Content of Organisms. J. H. Bodine (*J. Exp. Zool.*, 1921, **34,** No. 2).—The catalase content of grasshopper, firefly, potato beetle decreases with increasing age. CO_2 output and catalase content seem to vary in the same direction, but in hibernating animals (grasshopper) such a relation does not exist. Catalase content decreases during starvation. Further data are necessary to show a definite relationship between catalase content and CO_2 output.—W. D. H. (*W. I.*).

2833. Action of Low Temperatures and Cold Baths on Oxidation. W. E. Burge and J. M. Leichsenring (*Amer. J. Physiol.*, 1921, **56,** 408-14).—Cold increases blood-catalase in warm-blooded animals, and so leads to increase of oxidation. The drop in oxidation which cold produces in cold-blooded animals is because of a decrease of catalase. This paper is thus another example of the author's efforts to make catalase explain the universe and all that is therein.—W. D. H.

2834. Is Catalase a Measure of Metabolic Activity? S. Morgulis (*Amer. J. Physiol.*, 1921, **57,** 125-34).—A severe criticism of Burge's methods and conclusions, based on experimental work. The general conclusion drawn is that, whatever be the function of this widely-distributed enzyme, it is certain that it is not a measure of metabolic activity.—W. D. H.

2835. The Catalase Reaction. S. Morgulis (*J. Biol. Chem.*, 1921, **47,** 341-75).—A detailed study of the decomposition of hydrogen peroxide by a crude catalase preparation from liver. The catalase appears to be used up during the reaction, but for all the results one must consult the original paper.—H. E. R.

PHYSIOLOGY OF INVERTEBRATES

2836. H-Ion Concentration of Protozoan Cultures. J. H. Bodine (*Biol. Bull.*, 1921, **41,** No. 2).—The data give the changes in the H-ion concentration and the titratable acidity and alkalinity of hay and soil cultures prepared in various ways. In general it is found that cultures early show decreases in P_H concentration; this low value is followed by a progressive increase until an alkaline reaction is eventually reached.—W. D. H. (*W. I.*).

2837. The Axial Gradients in Hydrozoa—IV. C. M. Child (*Biol. Bull.*, 1921, **41,** No. 2).—Hydroids and hydromedusæ placed in dilute solutions of potassium permanganate show characteristic axial gradients in rate and total amount of reduction of permanganate. These gradients correspond with the physiological gradients indicated by other methods and by the development, growth form, and functional activities of the organisms. In general, the rate and amount of reduction decrease basipetally.—W. D. H. (*W. I.*).

2838. Chromosomes and the Life-Cycle of Hydatina senta. A. F. Shull (*Biol. Bull.*, 1921, **41,** No. 1).—The number of chromosomes in this rotifer appears to be 12 in both male producers and female producers. Hence the changes in the life-cycle are not

associated with changes in the number of chromosomes. In the male-producing egg the chromosomes meet in pairs, after which 6 go to each end of the spindle. The male therefore presumably begins development with the haploid number.—W. D. H. (*W. I.*).

2839. Chemical Stimulation of the Annelid Nerve Cord. A. R. Moore (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 213-4).—Substances such as KCl, which, according to Maxwell, act only upon medullated nerve fibres, stimulate the annelid nerve cord. It is inferred that the nerve processes reacting do not differ in this respect from the axons of the myelinated fibres of mammals. Of substances which, according to Maxwell, act on the grey matter only, some, such as camphor and strychnine, stimulate the annelid nerve cord; others, such as phenol, nicotine, and creatine, do not. This indicates a chemical organisation different from that obtaining in the neurons of higher forms.—D. H. de S.

2840. The Direction and Frequency of Mutation in the Bar-Eye Series of Multiple Allelomorphs of Drosophila. C. Zeleny (*J. Exp. Zool.*, 1921, **34,** No. 2).—Title given for those interested.—W. D. H. (*W. I.*).

2841. Reproductive System of Cimex, with Special Reference to the Behaviour of the Spermatozoa. F. W. Cragg (*Indian J. Med. Res.*, 1920, **8,** 32-78).—A full description of the subject in the title is given, with excellent plates. The matter should interest not only entomologists, but those also who are concerned with the transmission of disease by bugs.—W. D. H.

2842. A Symbiotic Fungus occurring in the Fat Body of Pulvinaria innumerabilis. C. T. Brues and R. W. Glaser (*Biol. Bull.*, 1921, **40,** No. 6).—The occurrence of micro-organisms in the tissues, particularly the fat body, of various insects has been known for a number of years. These have been regarded as yeasts. A species occurring in the cottony maple scale (*P. innumerabilis*) was cultivated by the writers. It proved to be a fungus, although only yeast-like forms occur in the insect. Serological tests showed that the organism obtained in culture was identical with the one in the scale insect. This fungus produces a protease, a lipase, and a diastase. On this basis it appears probable that it is actually associated with the metabolism of its host, and that it may consequently be regarded as truly symbiotic.—W. D. H. (*W. I.*).

2843. A Periodic Structure in Many Insect Scales and the Cause of their Iridescent Colours. H. Onslow (*Phil. Trans. Roy. Soc.*, 1921, **211B,** 1-74).—Physicists have advanced several theories to account theoretically for the colours of insects; the principal explanations are that the colour is due to (1) diffraction, (2) interference, (3) the scattering of light by small particles, and (4) selective " metallic " reflection. The last much-favoured view attributes the iridescence to a hypothetical substance (Schillerstoff) in solution in the chitin which, like metallic films, reflects polarised light in a particular way. The present author has approached the subject by going to the bed-rock of microscopic structure in an attempt to clear up the matter; he has wished to discover if any definite structures exist which will fit in with theories. This work, the painstaking labour of years, is here presented in full detail with beautiful plates, and it is obviously impossible even to summarise the results of such numerous observations in a few lines. The work is not finished, and sufficient has been done to show that not one, but combinations of all 4 views must be called in to account for a very complex phenomenon. The mode of colour production is not uniform, some insects employing one, others other of the mechanisms mentioned; in some cases also the actual presence of pigments about which little is known chemically still further complicates matters.—W. D. H.

2844. Über den kristallographischen Charakter der Prismen in den Muschelschalen. W. J. Schmidt (*Zeit. f. allg. Phys.*, 1921, **19,** 191-229).—Contents indicated by title.—C. L. E.

2845. Salt Antagonism in Starfish Eggs. R. S. Lillie (*J. Gen. Physiol.*, 1921, **3,** 783-94).—The jelly around the eggs is insoluble in sea-water, but dissolves in pure NaCl isotonic with it. $CaCl_2$ in small concentration converts the latter into equality with sea-water. This effect of Ca is analogous to that on agglutination, cytolysis, membrane formation, and maturation in the living egg. It is inferred that the essential factor is the formation of insoluble colloidal salts of Ca with the structural colloids of the protoplasm. A certain proportion of such compounds is necessary for the normal behaviour of the plasma membrane. In pure NaCl, water-soluble compounds are formed and disintegration occurs.—W. M. B.

2846. Adaptation—V., VI., VII., VIII. W. J. Crozier (*Biol. Bull.*, 1921, **41,** No. 2).—V. The bivalve Lima is photonegative, and in vigorous individuals the response to illumination involves a true and accurate orientation of the body, with gape away from the light, by means of the long adhesive foot, which is itself perhaps photosensitive; orientation is followed by Pecten-like swimming, the valves being vertical. VI. Pale individuals of the usually blue-black *Ascidia atra*, a species normally occurring in sunlit places, are found in dark situations under stones. They resemble, in the absence of test pigment, ascidians of other species habitually living in shaded spots. Pale *A. atra* quickly blacken if placed in sunlight, but the absence of the normal pigmentation cannot be due to darkness, but is probably a consequence of deficient nutrition. VII. The colouration of *Stichopus mœbii* is variable, in some individuals probably of a concealing tendency; in others, the majority, it makes these animals conspicuous. Perhaps conditioned by the bulk of the animals, possibly by the presence of a repugnant quality of the flesh, such as leads to the rejection by fishes of fragments offered as food, a decided immunity from gross attack is, at all events, achieved. There is no more reason to regard the conspicuous type of pigmentation as a warning agent than there is to consider it the unchecked expression of innate metabolic activities. VIII. The behaviour of *Actinia bermudensis* is considered with reference to its intertidal habitat. It is likely that the habit of contraction when uncovered by the sea is important for the maintenance of the species between tidal limits, but there is no evidence here of a persistence of the rhythm of contraction and expansion in the absence of the tidal rise and fall. After a period of about 3 hours in still water the actinians close; they can at any time be caused to expand by agitating this water. Young individuals never directly exposed to the tidal cycle behave in the same manner.—W. D. H. (*W.I.*).

2847. Reactions to Light in the Larvæ of the Ascidians Amaroucium constellatum and A. pellucidum. S. O. Mast (*J. Exp. Zool.*, 1921, **34,** No. 2).—The tadpoles orient fairly precisely. When they emerge from the colonies they are strongly photopositive, but they remain positive only a few moments, after which they become photonegative. Many other details are given. All these reactions are due to changes in the illumination on the nerve endings at the inner surface of the pigment cup of the eye.—W. D. H. (*W. I.*).

CELLS AND TISSUES

2848. Physikalische Chemie der Zellatmung. O. Warburg (*Biochem. Zeit.*, 1921, **119,** 134-66).—Reviewing his former work, the author points out that the respiratory process has its site in the solid phases of the cellular structure; that these can adsorb dissolved substances like charcoal does; that narcotics influence respiration by producing surface changes, while cyanides affect it by uniting with the iron and so preventing it from acting as an oxygen carrier. The parallel existing between tissue oxidations and the oxidations effected by charcoal is a remarkable one; thus amino-acids adsorbed by charcoal are oxidisable by gaseous oxygen; the oxidation is inhibited by narcotics,

which reduce the available active surface, and is also inhibited by cyanides by the union of the latter with an essential constituent of the charcoal—probably iron. The present theory is that the resistance of materials to oxidation is overcome in cells in 2 ways: by adsorption and by the presence of heavy metals. This thesis is illustrated by adsorption experiments with cystine and animal charcoal, and charcoal made from benzoic acid to which variable amounts of salts of heavy metals were added.—C. L. E.

2849. The Action of Salts and Non-Electrolytes upon Buffer Solutions and Amphoteric Electrolytes, and the Relation of these Effects to the Permeability of the Cell. D. Haynes (*Biochem. J.*, 1921, **15**, 440-61).—Added to buffer solutions, neutral salts cause an increase, non-electrolytes a decrease, of H-ion concentration. Univalent and bivalent cations differ in their effect, as do also Na and K salts. Theoretical treatment shows that non-electrolytes added to the solution of an ampholyte may displace its iso-electric point. The phenomena of antagonism can be explained as resulting from the different effects of different cations on the reactions of the buffer mixture of the protoplasm. A theory of permeability based on the above observations and deductions is suggested, and the bearing of this theory on stimulation and narcosis is outlined.—J. A. H.

2850. Signification physio-pathologique de la margination des chondriosomes de la cellule hépatique au cours de l'intoxication par le sulfonal. E. Grynfeltt and R. Lafont (*Compt. rend. soc. biol.*, 1921, **85**, 406-8).—Histological observation of liver-cell changes in rabbits subjected to chronic sulphonal poisoning. The granular elements of the protoplasm rearrange themselves around the periphery. This may be a defensive reaction on the part of the cell.—J. H. B.

2851. The Recovery Process of Excitable Tissues—II. E. D. Adrian (*J. Physiol.*, 1921, **55**, 193-225).—The relation between the decline of the electric response and the return of excitability was investigated in different tissues. The electric response was determined by the capillary electrometer, which, when corrected by Burch's method, is superior to the string galvanometer, and gives a reliable means of timing rapid changes, as in nerve response; the adequacy of the capillary electrometer was shown by taking records of brief condenser discharges and comparing them with calculated curves. The absolute refractory period bears a variable relation to the electric response in different tissues; in the sartorius the R.P. and the rising phase of the electric response terminate together, in medullated nerve the R.P. nearly outlasts both the rise and decline of the response, and in cardiac muscle the R.P. is not over until the electric disturbance has quite subsided. In cardiac and skeletal muscle at low temperatures the R.P. lasts relatively longer than at room temperatures. The supernormal phase in acidified tissues (Abstract No. 2492, Vol. V., p. 393) is not associated with a prolonged or increased electric response. Since there is often no difference of potential between a surface which is recovering and one which is at rest, it would seem that the subsidence of the electric response and the return of the excitable condition are independent phenomena, the first perhaps caused, according to Lillie's membrane theory (Abstract No. 2185, Vol. V., p. 349), by a reduction of membrane permeability, and the second by a return from a stable to an unstable condition. There is, at all events, no evidence that the refractory state is due to exhaustion of active materials.—C. L. E.

2852. Types of Amitosis in Bone Cells. T. H. Bast (*Amer. J. Anat.*, 1921, **29**, No. 3).—Amitosis is the exclusive method of bone-cell multiplication. It consists of two types. In 1 the nucleus is dumb-bell shaped, and the centrosomes lie at either pole of the nucleus. In 2 the nucleus is horseshoe shaped, and the centrosomes which have not moved apart lie in the bay of the nucleus.—W. D. H. (*W. I.*).

2853. The Enamel Organ of the Mammalian Tooth. H. E. Jordan (*Amer. J. Anat.*, 1921, **29**, No. 3).—Histological details in the incisors of white rat and kitten. The enamel germ in both lacks an intrinsic blood-supply. The papillary layer is interpreted

as the result of pressure produced by impinging blood-capillaries. The stratum intermedium is interpreted as the result chiefly of the opposing pressures exerted upon the inner layer of the stellate reticulum by the elongating ameloblasts and the expanding intercellular spaces of the enamel pulp. There is no adequate evidence warranting ascription to either the papillary layer or the stratum intermedium of any specific rôle in amelogenesis distinct from the stellate reticulum as a whole.—W. D. H. (*W. I.*).

2854. The Estimation of Black Pigmentation in the Skin of the American Negro. T. W. Todd and L. Van Gorder (*Amer. J. Phys. Anthropol.*, 1921, **4**, No. 3).—If the Bradley colour top be used, it is essential to make correction for a considerable amount of black in the red disc. Melanin gives a fairly permanent colouration to the skin. There is probably very little change in the N value of the skin between the living and the dead. The N value is not affected by stretching or wrinkling the skin. The N value is unaffected by embalming or preservatives. Jaundice renders estimation of the N value unreliable. The N value cannot be called upon as a race distinction: brunettes of white stock have as high an N value as many negroes. The statements of previous workers regarding the increase of black pigmentation in the skin up to puberty and the decrease in the later part of life are confirmed. "N value" is evidently a technical term which is not explained.—W. D. H. (*W. I.*).

MUSCLE

2855. Über direkte und indirekte erregbarkeit quergestreifter Muskeln, zugleich ein Beitrag zur Pharmakodynamik des Kurarins. G. Edström (*Skand. Arch. Physiol.*, 1921, **41**, 101-61).—By a slight modification of the classical experiment of Claude Bernard it was found that the E.M.F. of threshold stimuli for curarised and normal muscles were respectively as 5 to 3. Perfusion experiments showed that curare, when concentrated, acts on the muscle as well as on the motor endings; but when relatively dilute, the direct excitability of the muscle is unchanged or even increased, and it is stated that the direct excitability undergoes no further change if a strong solution is subsequently perfused, though the indirect excitability is reduced. The effect of curare is reversible. The author concludes that muscle is itself directly excitable; also from condenser discharge experiments that it is more excitable to negative than to positive electricity.—C. L. E.

2856. Über die spontanreduzierende Einwirkung der Muskulatur auf Methylenblau. G. Ahlgren (*Skand. Arch. Physiol.*, 1921, **41**, 1-30).—The reduction of methylene blue *in vacuo* at body temperature by fresh, minced, unwashed muscle (0·1 to 0·4 grm.) was studied under various conditions; the reducing power for a given amount of methylene blue (20-400 γ: [1.γ=0·001 mg.]) is inversely as the time for complete decolorisation. The methylene blue used was 1: 5,000 or 1: 2,500 in water. No error is introduced by not washing out the blood from the tissue, nor, since reduction occurs rapidly, by presence of bacteria; an important factor is the freshness of the tissue, as the reducing power is diminished on standing. The rate of decolorisation is disproportionately accelerated when the mass of muscle is increased; this is owing to the provision of buffers from the muscle, whereby the reaction is stabilised. Addition of more H-donator in the form of succinate hastens the reaction in such muscles as lack such donators (spring frogs). Cardiac and red muscle reduce more rapidly than pale muscle, and the oxygen usages show the same orders of magnitude. Tetanised muscle reduces more quickly than resting muscle, perhaps on account of a mobilisation of donators. Reducing powers of various species were also compared.—C. L. E.

2857. Die Abhängigkeit der Wirkung der Succinodehydrogenase von der Wasserstoffionenkonzentration. E. Ohlsson (*Skand. Arch. Physiol.*, 1921. **41**, 77-100).—Water-

washed horseflesh was shaken with Na_2HPO_4 solution, and the extract used for methylene blue succinate reduction experiments *in vacuo* at 38° in presence of various buffer solutions. The P_H of the solution was then determined electrometrically, and the optimal P_H was about 8·7. The kinetics of the reaction are discussed.—C. L. E.

2858. The Comparative Atrophy of the Skeletal Muscle after Cutting the Nerve and after Cutting the Tendon. A. Lipschütz and A. Audova (*J. Physiol.*, 1921, **55,** 300-4).—Section of the tendo Achillis in rabbits causes atrophy of muscle which is nearly as great as that caused by nerve section. It is considered that the atrophy is due to inactivity. The relative amounts of water and of water-soluble substances are increased in the atrophied muscle.—J. A. C.

2859. Sobre um ponto interessante da theoria mathematica do trabalho muscular. M. O. de Almeida (*Brazil medico*, 29 Mai, 1920).—La théorie précédément publiée par l'auteur est indépendante des équations de Chauveau établies pour l'élasticité musculaire. Elle suppose uniquement que l'énergie des muscles est une fonction de la tension et que celle-ci croît pour des valeurs croissantes de la charge et de l'hauteur de sustentation.—M. O. A.

2860. The Double Innervation of Striated Muscle. J. T. Wilson (*Brain*, 1921, **44,** 234-47).—Excellent judicial review of the anatomical data establishing the existence of the seemingly motor, or at least efferent, nerve endings supplied to skeletal muscles by the sympathetic system. A good bibliography is appended.—C. S. S.

2861. Correlation of the Propagation Velocity of the Contraction Wave in Muscle with the Electrical Conductivity of the Surrounding Medium. S. E. Pond (*J. Gen. Physiol.*, 1921, **3,** 807-26).—Experiments on the heart of Limulus and the sartorius muscle of the frog show that the rate of propagation is in direct relation with the electrical conductivity of the solution in which they are immersed. This result confirms the view of Lillie that transmission depends on secondary electric stimulation of adjoining regions by the current arising from the changes of potential at an excited spot.—W. M. B.

2862. The Specific Electrical Resistance of Frog's Muscle. W. Hartree and A. V. Hill (*Biochem. J.*, 1921, **15,** 379-82).—The specific conductivity of frog's sartorius muscle is at all temperatures the same as that of a 0·36% NaCl solution.—J. A. H.

2863. Zur Lehre vom Muskeltonus. I. Über die Aufhebung des Muskeltonus durch Kokain und Novokain (Nikotin-Kokain-Antagonismus). E. Frank and R. Alexander-Katz. **II. Über den Angriffspunkt des Guanidins und Methylguanidins bei der Erzeugung motorischer Reizerscheinungen (Guanidin-Kokain-Antagonismus).** E. Frank and R. Stern (*Arch. exp. Path. Pharm.*, 1921, **90,** 149-79).—The power of intramuscular injections of cocaine to reduce muscular spasms in tetanus has been ascribed to its paralysing effect on the sensory terminations in the muscles of the proprioceptive reflex arc. The authors show that this explanation is probably incorrect, inasmuch as cocaine can abolish a nicotine spasm in the muscles of a frog produced 21 days after the nerves to the muscle have been cut. The authors consider that cocaine abolishes muscular tone in the same way as does section of the " parasympathetic tonus nerves " in the posterior roots. The second paper demonstrates the power of cocaine to abolish the muscular spasms produced by guanidine. The authors show that when spasms are induced by guanidine in a muscle, the excitability of the motor nerve towards break induction shocks is not raised, and conclude that guanidine does not affect the motor nerve or muscle spindles, but acts on the receptive substance of the sarcoplasm corresponding with the parasympathetic tone nerves. Thus atropine can abolish guanidine spasms.—J. H. B.

2864. Oscillations in Diaphragm Muscle. L. B. Nice and Alma J. Neill (*Amer. J. Physiol.*, 1921, **56,** 487-91).—Oscillations in " tonus," similar to those in sleep, anæsthesia,

and after decerebration, may appear when the peripheral end of one phrenic nerve is stimulated with induction shocks, both nerves being divided. They may appear and disappear. They have no obvious relation to the blood-pressure, and seem to be due to changes in the irritability of the diaphragm muscle itself.—W. M. B.

2865. Oscillations in Diaphragm Muscle. L. B. Nice and Alma J. Neill (*Amer. J. Physiol.*, 1921, **57,** 171-8).—In urethanised and decerebrate animals (dogs, cats, rabbits) 5 types of oscillation are described; these forms appear, fade, and reappear at any time 1 to 6 hours after the observations are begun; their character does not seem to be related to changes in blood-pressure.—W. D. H.

2866. Kohlensäuredruck oder Eiweissquellung als Ursache der Muskelkontraktion? —II. L. Wacker (*Biochem. Zeit.*, 1921, **120,** 284-302).—A further defence of the author's theory that muscular contraction is due to the establishment of internal pressure caused by hydrolytic scission and liberation of CO_2, while the recovery process is associated with oxidation of the potassium lactate to bicarbonate (see Abstracts No. 500, Vol. III., p. 102; No. 1653, Vol. IV., p. 266; and No. 2860, Vol. V., p. 456).—C. L. E.

2867. Einflüsse auf das Leistungsvermögen des Muskels. D. Rancken (*Skand. Arch. Physiol.*, 1921, **41,** 162-87).—For the study of muscular efficiency under various conditions the author uses a new type of hand dynamograph, consisting of a rubber ball filled with water and communicating with a modified membrane manometer. Calibration is in terms of cm. Hg measured by adding a Hg manometer for the purpose. The ball is squeezed at the required rate by the hand. Increase of the general illumination increases, while reduction diminishes the work done in unit time. Warmth, effleurage, and vibration lower the strength of contractions. Change of posture from sitting to standing, walking, or running progressively increase the power of contraction. Psychic influences are also important.—C. L. E.

2868. Contribution à la physiologie du Parkinsonisme. G. Marinesco and Rascanu (*Compt. rend. soc. biol.*, 1921, **85,** 546-50).—In Parkinson's disease the moment at which the contraction of a muscle (*e.g.*, biceps) reaches its maximum is not coincident with the moment at which its antagonist (triceps) is maximally relaxed. A muscular contraction often has 2 summits in this condition. The first is due to a short clonic contraction, the second to a prolonged tonic contraction. These in a healthy individual are superimposed.—J. H. B.

2869. Spasmophilie und Muskelzuckung. A. Eckstein (*Arch. f. Kinderheilk.*, 1921. **69,** 426-30).—Bossert and Gralka (*Jahrb. f. Kinderheilk.*, 1921, **44,** 145) tried to utilise the form of the contraction of the directly irritated skeletal muscle for the analysis of spasmophilia. According to the present author, this is untenable.—H. W.

NERVOUS SYSTEM

2870. Effect of Hæmorrhage on Sympathetic Nerves. H. McGuigan and H. V. Atkinson (*Amer. J. Physiol.*, 1921, **57,** 95-103).—Hæmorrhage in many cases sensitises or stimulates the sympathetic system governing vascular tone (dogs). If drugs are used which stimulate or depress the centres and not the periphery, it is shown that the influence of hæmorrhage is mainly peripheral.—W. D. H.

2871. Action paralysante du bleu de méthylène sur les terminaisons nerveuses parasympathiques. W. Koskowski and E. Maigre (*Compt. rend.*, 1921, **173,** 397-8).—Intravenous injections of methylene blue (0·2 gm.) produce the same vagus paralysis in dogs which has been described in frogs. Respiration is affected as by vagus section. The chorda tympani is paralysed. Methylene blue produces a rise of blood-pressure. This rise still occurs after the ganglia are paralysed with nicotine. Excitation of the

splanchnic (when the suprarenal vein is ligatured) produces a greater rise of pressure after a methylene blue injection than before.—J. H. B.

2872. Un curieux phénomène d'automatisme chez l'homme. A. Schwartz and P. Meyer (*Compt. rend. soc. biol.*, 1921, **85,** 490-2).—This phenomenon is produced as follows: The observer stands beside a wall or door, so that the wall is on his right (or left) side. The arm is hanging by the side, palm inwards. An attempt is sustained for 10 to 15 secs. to push the wall over by forcing the back of the hand against it. On stepping away from the wall, the arm used will of its own accord suddenly rise to a more or less horizontal position (a well-known drawing-room trick in this country.—W. D. H.). This phenomenon has a nervous origin, for records obtained with the string galvanometer showed the same oscillations during the automatic contraction as during the preceding voluntary effort.—J. H. B.

2873. After Contraction of Voluntary Muscles. J. Pinkhof (*Ned. T. v. Gen.*, 1921, **65,** 437).—This deals with the same phenomenon, and the author also observed action currents during the involuntary raising of the arm. He states that the phenomenon was first observed by Kohnstamm (*Neurol. Zentrlbl.*, 1915, p. 290).—R. B.

2874. Rhythmenbildung und Erregbarkeit. F. Eichholtz (*Zeit. f. allg. Phys.*, 1921, **19,** 230-43).—Experiments on the relation between tonic and rhythmic processes in the spinal cord. Tonic and rhythmic reflexes are antagonistic; the rhythmic reflexes are best seen in excitable preparations.—C. L. E.

2875. The Effect of Tonic Labyrinthine and Cervical Reflexes upon the Eye Muscles. A. de Kleijn (*Proc. Kon. Ak. v. Wetensch.*, **23,** 509).—As has been previously demonstrated by Weiland for the skeletal muscles, the state of tonus of the eye muscles in the rabbit appears to depend on the position of the head. The reflexes which control this tonicity can be divided into two groups: tonic labyrinthine reflexes and tonic cervical reflexes. The tonic labyrinth reflexes can be examined separately by bringing the head into various positions in space without changing its position relative to the trunk. The cervical reflexes can be examined separately by bringing the trunk into various positions relative to the head, or conversely the head into various positions relative to the trunk. To preclude tonic labyrinth reflexes, both labyrinths are extirpated in these experiments. For the isolated cervical reflexes it was found that to every position of the trunk relative to the head there is a special position of the eyes in the orbits. For further details about the eye movements corresponding with movements of the trunk the original article should be referred to. In some rabbits the centripetal fibres for the reflex arc of the tonic cervical reflexes pass through the sensory roots of the N. cervicales I. and II. In others also the sensory roots of the N. cervicalis III. exert some influence. With tonic cervical reflexes the eye muscles are influenced by a reciprocal innervation as was observed for the M. recti externus and internus. A combination of the 2 kinds of reflexes is necessary to enable the rabbit to raise or lower its head within wide limits without change of the position of its eyes in space, consequently without any alteration of the field of vision. (Compare Abstract No. 194, Vol. VI., p. 29.)—R. B.

2876. Reflexo plantar e innervação reciproca. M. O. de Almeida (*Archivos brasil. de neuriat. e psychiat.*, II., 1920, 213-219).—Dans les cas de réflexe de Babinski, l'anémie des membres inférieurs fait disparaître le réflexe en extension et réapparaître le réflexe en flexion. Ce fait est incompatible avec l'application à ce cas des lois de l'innervation réciproque. Si celle-ci existe pour le réflexe plantaire, elle ne peut être localisée que dans les organes périphériques.—M. O. A.

2877. Os reflexos musculares. M. O. de Almeida (*Brazil medico*, July 2, 1921).—Chez la grenouille les réflexes musculaires peuvent être produits par les excitants électriques et mécaniques. Les excitants chimiques (acides, ammoniaque) sont inefficaces.

Les réflexes produits par les excitants mécaniques montrent fréquemment une certaine coordination. Les excitations des fléchisseurs donnent lieu presque toujours à des contractions des extenseurs.—M. O. A.

2878. Autolysis. VII. Autolysis of Brain. C. A. Gibson, F. Umbreit, and H. C. Bradley (*J. Biol. Chem.*, 1921, **47,** 333-9).—Brain tissue autolyses in the same way as other tissues. Brain cells contain proteolytic enzymes which digest added substrata such as gelatin or peptone. The autolytic disintegration of the delicate protein structures of brain tissue appears to be an irreversible phenomenon, and is accompanied by loss of such characteristic functions as memory, habit, motor control, and consciousness. —H. E. R.

2879. Influence des lésions cérébrales et cérébelleuses sur la diurèse. E. Hug (*Compt. rend. soc. biol.*, 1921, **85,** 594-5).—Piqûre carried out on the cerebral hemispheres and cerebellar lobes of 39 dogs produced no appreciable effect on diuresis.—J. H. B.

2880. I. Sur le rôle du cervelet dans la phonation. II. Sur l'aphasie motrice. III. Aphasie sensorielle. Noica (*Compt. rend. soc. biol.*, 1921, **85,** 550-5).—Evidence to show that the cerebellum is concerned with the facilitation of speech.—J. H. B.

2881. Über die Markbildung des Hinterstranges des Rückenmarks. I. Kaufman (*Z. f. d. ges. Neurol. u. Psychiat.*, 1921, **67,** 190).—The matter is discussed from the standpoint of tabes, on which other papers from the same laboratory occur in the same issue of the *Zeitsch.* The author differs from Flechsig on various points. The posterior columns are myelinated later than the antero-lateral columns, and the posterior later than the anterior nerve roots. Myelination first appear in Flechsig's middle zone of the column (root entry zone); there was no myelination at all in a 4-month fœtus. The shorter fibres are the first to become medullated; the long ascending fibres follow later. Degeneration of posterior root fibres follows the same laws; the short and medium fibres which lie thick at the root entry zone degenerate before the long fibres in tabes. Tabes is not a primary collective degeneration, but its essential lesion is due to spirochætes growing in posterior roots, and producing as its essential lesion a growth of peculiar granulation tissue in the nerve sheaths, which spreads and causes degeneration of the nerve fibre secondarily. The paper, with its fellows, occupies more than 200 pages, but will repay perusal.—W. D. H. (*Med. Sci.*).

2882. Hirnrinde und Hirnstamm. N. v. Mayendorf (*Zeit. f. allg. Phys.*, 1921, **19,** 244-68).—A general review unsuited for abstraction.—C. L. E.

2883. On Structural Laws in the Nervous System: the Principles of Neurobiotaxis. C. U. Ariens Kappers (*Brain*, 1921, **44,** 125-49).—Evidence from comparative anatomy of the tendency for the dendrites and perikarya of neurons to migrate bodily toward the axons from which they receive preponderantly frequent stimulation. Evidence that, on the other hand, axons grow out in the direction of their own normal conductivity. The explanation offered is galvanotropism. That of the axon has been shown (Ingvar) to be opposite to the cathodal tropism of the dendrites and perikaryon. These latter exhibit their tropism—*i.e.*, neurobiotaxis—only after the Nissl bodies have developed. The growth of the axon is promoted by the action currents descending it; the formation and contraction of the dendrites is homologous to the cathodic outgrowths and contraction of pseudopodia. The view of Balfour that neuronal connections are not preestablished (Hensen), but acquired by growth, is upheld, and the selectivity of the connection is assigned to bioeletric affinity of the positively charged tip of the growing axon bud for the cells in a state of ionisation owing to activity around it. In short, the directions of growth, the interconnections, and the peripheral connections of the neurons composing the nervous system are considered by the author to be accomplished largely by galvanotropisms.—C. S. S.

SPECIAL SENSE ORGANS

2884. Energy and Vision. P. L. du Noüy (*J. Gen. Physiol.*, 1921, **3,** 743-64).—Measurements by a new method of the minimum energy required for vision at different wavelengths gave results in good agreement with those of S. P. Langley.—W. M. B.

2885. Über Theorien des Farbensinnes. H. Koellner (*Münch. med. Woch.*, 1921, **68,** 1045-7).—A discussion of theories of colour vision.—J. H. B.

2886. Über die Quelle und den Verlauf der intraocularen Saftströmung—VII. E. Seidel (*Arch. f. Ophthalm.*, 1921, **104,** 284-92).—The vital colouring of the epithelial cells of the ciliary body by isamin blue is caused by the electrical current of the epithelium, which the author has detected with the galvanometer, and which effects a "flaking out" of the colour particles. They are not united with preformed elements of the protoplasm.—H. W.

2887. Untersuchungen zur Physiologie der räumlichen Tastempfindungen unter Berücksichtigung der Beziehungen des Tastraumes zum Sehraum—I. E. Gellhorn (*Pflüger's Arch.*, 1921, **189,** 215-38).—Experiments on the relation between kinæsthetic and visual spatial judgments were made—*e.g.*, as follows: the finger and thumb of the blindfold subject are placed on the points of an æsthesiometer; they are then separated a certain distance by the experimenter; the subject is now allowed to see the æsthesiometer limbs separated, and is required to say when the distance between them is equal to the former distance. An important factor in the judgment is the rapidity of movement of the members in the first part of the test, the slower movement appearing the greater in adults, while in children the reverse is often the case, possibly because attention is more concentrated during the rapid movement. With practice the illusion is reduced by improvement of the tactile judgment. When varying distances are covered at constant speed, the tactile estimation is too low when the distance is greater. The error is often increased by practice, owing to suggestion. Optical localisation of a given point on the skin (Volkmann's method) is less accurate than tactile localisation (Weber's method), but both are improved by practice. In the use of localisation methods only pure touch spots must be used, as temperature spots give different results.—C. L. E.

2888. Structure fine des corpuscules tactiles. G. Marinesco (*Compt. rend. soc. biol.*, 1921, **85,** 542-4).—Two beautiful illustrations are given of the histological appearance of Meissner's corpuscles. Meissner's corpuscles and those of Pacini are said to contain oxidases.—J. H. B.

2889. I. Sur la structure des corpuscules de Vater-Pacini chez le chat. II. Sur la présence de corpuscules de Vater-Pacini dans les ganglions lymphatiques du chat. R. Collin (*Compt. rend. soc. biol.*, 1921, **85,** 511-5). — A histological examination of the structure of Vater-Pacini nerve endings in the pancreas of the cat, and a demonstration of their presence in the lymph glands of the mesentery.—J. H. B.

2890. Über die nicht-akustischen Labyrinthfunktionen bei Anurenlarven. K. Herter (*Zeit. f. allg. Physiol.*, 1921, **19,** 335-414).—Morphological differentiation of the membranous labyrinth is completed after absorption of the external gills of the tadpoles; the various semicircular canals develop in different sequence in different species. Each labyrinth controls the tonus of the muscles of the opposite side, and at later stages of development also, to some extent, those of the same side. The effect of unilateral labyrinth destruction is to some extent recovered from in the course of time; the effect of bilateral destruction is permanent, though such larvæ may survive and undergo metamorphosis. Partial destruction of the labyrinth apparatus shows that the pars superior controls tonus of the contralateral musculature, and that the statolith apparatus of the utricle is concerned with postural stimuli. Many other details are given.—C. L. E.

2891. Sulla percezione della direzione del suono. A. Aggazzotti (*Arch. di fisiol.*, 1921, **19,** 33-46).—In our perception of sound direction two different factors appear to take part: one is due to the special sensation that sound causes in the ear which is first affected by it; the other is defined as the capability of expressing an opinion on the localisation of a sound in space. By means of the first the sound is heard, by means of the second the central nervous system decides which of the two ears was first affected by the sound waves.—C. d. F.

2892. Otocysts of Gonionemus. L. J. Thomas (*Biol. Bull.*, 1921, **40,** No. 6).—In *G. verteus* and *G. murbachii* the otocyst has two distinct vesicles. The more conspicuous primary vesicle has a protective function enclosing the essential sensory mechanism. The secondary vesicle contains the otolith. No sensory hairs or ridges have been demonstrated. Puncture of the primary vesicle does not impair the essential sensory mechanism. Statements as to the orientation of these otocysts are at error in many points. They are not "external," but occur embedded within the mesoglœa.—W. D. H. (*W. I.*).

2893. Adsorption of Odorous Molecules to the Surface of Solids. H. Zwaardemaker (*Proc. Kon. Ak. van Wet.*, **23,** date, page, etc., not supplied).—In many cases a prolonged and marked adsorption of odorous molecules to solid bodies takes place as soon as their surfaces have come into contact with odorivectors (*e.g.*, valeric acid). This adsorption depends chiefly on the presence of a condensation layer of air and water vapour on all surfaces; secondly, a direct adsorption is possible on surfaces from which this layer has been purposely removed; and, finally, it might occur on electrically charged surfaces. The sub-layer has some influence on the composition of the adsorbed air-vapour layer, and consequently also on the conduct of this layer towards odorous substances. In the case of an adsorption of the first sort, the duration of the adsorption will be a function (1) of the lowering of the surface tension of the condensation layer; (2) of the solubility of the odorous matter in water; (3) of the thickness of the condensation layer; (4) of the volatility of the odorous substance from water. The adsorption to solids without a condensation layer may also be of a very different duration. Electric charges of the solids have no influence; it seems that the molecules of the odorivectors are not electrically charged themselves.—R. B.

CEREBRO-SPINAL FLUID

2894. Absorption from the Ventricles in Internal Hydrocephalus. G. B. Wislocki and T. J. Putnam (*Amer. J. Anat.*, 1921, **29,** No. 3).—Hydrocephalus was produced in kittens and young rabbits by injecting lampblack into the cisterna cerebello-medullaris. Subsequently a readily diffusible solution or a colloidal dye was injected into the dilated ventricles. Absorption occurs to some extent from the ventricles in hydrocephalic animals, and the pathway of escape is through the ependyma into the intercellular spaces, and finally into the perivascular spaces. The diffusion of a true solution (potassium ferrocyanide and iron ammonium citrate) from the cerebral chambers into the brain substance is fairly rapid, but that of a colloidal suspension (trypan blue) is somewhat slower. No observations on the rapidity of absorption of the foreign substances into the cerebral capillaries were made. No evidence of absorption by the choroid plexuses was observed.—W. D. H. (*W. I.*).

2895. Estimation of the Total Protein in the Cerebro-spinal Fluid. J. B. Ayer and H. E. Foster (*J. Amer. Med. Assoc.*, 1921, **77,** 365-9).—Denis and Ayer's method Abstract No. 3043, Vol. V., p. 483) was used. The normal content is 25 mg. per 100 c.c.

on the average. Amounts above 40 are abnormal, the excess being greatest in acute form of meningitis (average 364 in streptococcic and pneumococcic forms).—C. L. E.

2896. The Choroid Plexus in General Paralysis and Other Mental Diseases. T. Morowoka (*Proc. Roy. Soc. Med.*, 1921, **14,** Sect. of Psychiat., 23-8).—A histological study illustrated with excellent plates. So far only 26 cases have been studied, and the subject is to be followed up. The author wisely omits drawing general conclusions; the most frequent changes, where any are noted, appear to be increase of acidophil staining and evidence of hyper-secretion.—W. D. H.

2897. Modifications fonctionnelles des cellules des plexus choroïdes. J. Watrin (*Compt. rend. soc. biol.*, 1921, **85,** 529-30).—A histological examination of the cells of the choroid plexus from animals killed in various ways. Two different pictures are obtained according as the animals are (1) bled out or (2) killed by asphyxia or $CHCl_3$. These pictures are taken to indicate different functional conditions.—J. H. B.

PSYCHOLOGY

2898. The Use of Experimental Psychology in the Practice of Medicine. E. Jacobson (*J. Amer. Med. Assoc.*, 1921, **77,** 342-6).—An address in which is pointed out the importance of psychology in relation not merely to psychiatry, but also to general medicine. The effects of suggestion and emotion, the origin of subjective symptoms, the mental factors in particular diseases, the psychology of a prognosis, and the psycho-physiology of anæsthetics are some important headings.—C. L. E.

2899. On Resistance and Potential Differences in the Psychological Galvanic Reflex. J. Roos (*Werk. v.h. Gen. t. Bev. v. Nat. Gen. en Heelkunde.*, 2nd Ser., D. X., afl. 1, 1921, p. 69).—The electric reaction of a person, when an organ of sense is stimulated (measured by bringing 2 spots of the body in contact with the string galvanometer), may have 2 groups of physical causes. These are, first, the development of potential differences; and, secondly, alterations in the electric resistance and in polarisation. The second influence was measured separately from the first, and proved to be about 20 times as large. For some persons the proportion was an inverse one. (Compare Abstract No. 2521, Vol. VI., p. 364.)—R. B.

2900. (1) **The Inspiration-Expiration Ratio during Truth and Falsehood.** H. E. Burtt. (2) **Experimental Study of Motor Ability.** F. A. C. Perrin. (3) **Simple Reactions to Light and Sound.** F. L. Wells, C. M. Kelley, and G. Murphy. (4) **Experimental Study of " Stimulus Error."** S. W. Fernberger (*J. Exp. Psychol.*, 1921, **4,** 1, 24, 57, 63-76).—These 4 papers comprise the most recently arrived number of this journal. (1) This strikes one as an example of how not to do it. The obvious method to a non-psychologist would be to ascertain if lying makes the respiration different, though the difficulty of testing a real liar seems prohibitive; the method used was to get college students to tell pretended lies in sham trials before a mock jury. The result, as one would expect, was not definite. That emotion raises the blood-pressure is well known, and one supposes there would be some mental excitement when one is doing one's best to pose as a first-class liar. Yet it is suggested that psychological tests of this nature might be useful in courts of law. (2) The purpose of this study was an analysis of motor ability, sorting cards and the like, and the correlation of this ability with others such as character. " It is sufficiently obvious that any conclusions must be regarded as tentative and even speculative." (3) This seems to be the only real bit of work in the series. The measurement of reaction times is monotonous, but it seems to be the only exact sort of work open to psychologists at present. The details given show that idiosyncrasy in the sound-light ratio occurs, that sound has the preference, and that the

best performers in response to the stimulus of sound are not equally proficient towards light. (4) The last paper beats me. It will perhaps be enough to quote the first and last conclusions of the author: "(i.) It is evident that a trained observer is able by an additional abstraction and isolation to judge intensity differences of a single modality from a complex in which several modalities of sensation are present simultaneously." "(viii.) This experiment seems to show the futility of properly interpreting the statistical results of a purely behaviouristic study without the control of introspective report." Futility seems to be an appropriate word, but one trusts that behaviouristic will remain on the other side of the Atlantic.—W. D. H.

BLOOD

2901. Resistance of Erythrocytes. R. Brinkman (*Werk. v.h. Gen. t. Bev. v. Nat. Gen. en Heelkunde.*, 1921, 2nd Ser., Dl. **9,** afl. 1).—Researches on the resistance of the red blood-corpuscles towards osmotic influences do not agree. The chief cause is that investigators use different methods. For a general method of hæmolysis a pure NaCl solution is unsuitable. By addition of an additional quantity of the same hypotonic solution to the blood-corpuscles which are not yet hæmolysed a fresh hæmolysis is obtained. The pure NaCl solution has a lyotropic effect upon the hydrophile colloids of the cell membrane, which may be balanced by $Ca^{\cdot\cdot}$ ions. A maximal osmotic resistance coincides with a very definite ($Ca^{\cdot\cdot}$) in the same way as the permeability of the glomerular membrane does. In hæmolysis by NaCl solution, $Ca^{\cdot\cdot}$ ions get into the suspension liquid, which protect the still remaining blood-corpuscles against the lyotropic effect of the NaCl solution. The maximal resistance is found not to be the physiological. In the plasma $(Ca^{\cdot\cdot})=k.\frac{(H)}{(HCO_3')}$. With a high CO_2 tension the resistance is lowered (*e.g.*, in venous blood). The author now uses a suspension liquid containing $NaHCO_3$, 0·17; KCl, 0·02; $CaCl_2$ 6 aq., 0·02%, and different quantities of NaCl, whilst $H^{\cdot}$ is kept at $0{\cdot}45\times10^{-7}$. When blood-corpuscles are washed with this solution their resistance increases. This is due to the removal of lecithin, which is adsorbed at the surface of the cells; it is an autohæmolysin. Cholesterol balances this action. Some of the consequences of this opinion are referred to in connection with permeability and immunological matters.—R. B.

2902. Resistance of the Red Blood-Cells. C. H. Neilson and H. Wheelon (*J. Lab. and Clin. Med.*, 1921, **6,** 487-504).—The resistance of the red cells to sapotoxin solutions varies in different diseases, and this variation is intimately associated with alterations in the metabolism of cholesterol. The resistance is increased in pregnancy, pulmonary tuberculosis, lead poisoning, and arterio-sclerosis; it is diminished in syphilis and in cases of malaria in which quinine is being administered; it is apparently unaffected in malaria as such, in typhoid fever, and in cases of malignant growths.—D. H. de S.

2903. Resistance of the Red Blood-Cells. C. H. Neilson and H. Wheelon (*J. Lab. and Clin. Med.*, 1921, **6,** 568-78).—The authors are of opinion that the red cells may be considered as composed of jellies which exist and depend upon their content of lipoids. The cholesterol, both of the cell itself and about the cell, acts as an antihæmolytic, while lecithin tends to combine with toxins to form lecithides. Such formations react upon the cell to destroy its composition, thereby liberating the hæmoglobin from the stroma. Diseases in which the cholesterol content is high show an increased red cell resistance to sapotoxin solutions; those in which the cholesterol content is low show a lessened resistance to specific hæmolytic agents. Hence it is concluded that the

cholesterol of the blood in great part determines the degree of resistance of the red cells to sapotoxin solutions.—D. H. de S.

2904. Über die Wirkung von Eosin und Rose bengale auf rote Blutkörperchen und den Zusammenhang von Aufnahme und biologischer Wirkung. A. Jodlbauer and F. Haffner (*Pflüger's Arch.*, 1921, **189,** 243-60).—Rose bengal (tetrachlor-tetraiodo-fluorescein, Na salt) is 100 times more powerful as a hæmolytic agent than eosin (Na salt of tetrabromfluorescein). The uptake of the dyes followed the law of adsorption. The different effects were due entirely to the greater ease with which the rose bengal was adsorbed. The reaction of the solution was also of importance —the more acid the solution, the more readily was the dye adsorbed, and the more readily hæmolysis was produced. The effect on the corpuscles was a typical alteration of the colloids by the effect of the anion, hæmolysis being caused by increased hydration.—C. L. E.

2905. Über die Aufnahme von Eiweissabkömmlingen (Peptone, Polypeptide und Aminosäuren) durch rote Blutkörperchen unter bestimmten Bedingungen. E. Abderhalden and H. Kürten (*Pflügcr's Arch.*, 1921, **189,** 311-22).—Washed ox-corpuscles were suspended for 45 minutes at room temperature in a slightly hypertonic solution of NaCl containing the derivative under investigation. After centrifugation, the amino-nitrogen of the clear fluid was estimated by Sörensen's method, the reduction of amino-N giving the amount of amino-acid taken up. Glycine, alanine, *d-l*-valine, *d-l*-leucine, *l*-tryptophane, glycyl-*d*-isovaline, *d-l*-leucyl-glycine, *d-l*-leucyl-glycyl-glycine, and silk peptone were used; all were taken up in accordance with the laws of adsorption. Apparent exceptions provided by leucine, the polypeptides, and peptone were due to the fact that these caused agglutination of corpuscles, so that the uptake was smaller for the higher concentrations; but if the suspension was shaken to reduce the agglutination, almost normal values were also obtained for these substances. It is pointed out by the authors that the adsorption does not necessarily hold under conditions other than those of their experiments, nor for other blood-corpuscles. Thus horse-corpuscles gave irregular results.—C. L. E.

2906. Zur Kenntniss lichtkatalytischer Wirkungen. H. Pfeiffer and G. Bayer (*Zeitsch. f. d. ges. exp. Med.*, 1921, **14,** 137-219).—The degree of hæmolysis of the eosin-sensitised erythrocytes of different animals by light is proportional to the intensity of the light, and within limits also to the amount of eosin added. Differences of lipoid content of the cells do not influence the result, nor is there any marked alteration in the stroma except with very prolonged and intense illumination. Photodynamic hæmolysis continues to progress for even 24 hours after termination of the illumination. The fluorescence of eosin is not responsible for its photodynamic effects. An inhibition of the after-effect of light on the red cells can be effected by serum, and is due to the serum proteins. The photodynamic effects of eosin on KI solution (splitting off of free I) was also studied; it shows no after-effect. There are many other points discussed, but these are not suitable for abstraction.—H. W.

2907. Die Prüfung der Senkungsgeschwindigkeit der roten Blutkörperchen als diagnostisches Hilfsmittel. E. Abderhalden (*Münch. med. Woch.*, 1921, **68,** 973).—The rate of sedimentation of red cells is markedly affected by the plasma in which the corpuscles are suspended. Plasma with a high agglutinating capacity increases the rate of sedimentation.—J. H. B.

2908. Kolloidstudien über den Bau der roten Blutkörperchen und über Hämolyse. III. Ultramikroscopische Untersuchungen an Lipoiden. K. Hattori (*Biochem. Zeit.*, 1921, **119,** 45-64).—The colloidal balance of an optically homogeneous cholesterol-lecithin mixture is altered by water owing to swelling of the lecithin and separation of the cholesterol. By saline, however, the degree of swelling of lecithin is limited, and

there is no separation of cholesterol. Reagents which affect the colloidal balance are hæmolytic, but the parallelism is only approximate.—H. K.

2909. Veränderungen des weissen Blutbildes bei intravenösen Infusionen. L. Nürnberger (*Deutsch. Arch. f. klin. Med.*, 1921, **136,** 159-69).—After intravenous infusions of solutions of dextrose, lævulose, and NaCl, a considerable leucocytosis occurs, not caused by the inundation of the body with water, but specific for the dissolved substances. The results concerning the relation between the various forms of leucocytes are given in curves.—H. W.

2910. The Coagulation of the Blood. II. The Clotting Complex. H. W. C. Vines (*J. Physiol.*, 1921, **55,** 287-95).—The clotting complex (see Abstract No. 2140, Vol. VI., p. 309) is a combination of a lipoid, calcium, and a protein; the lipoid and calcium are essential; the calcium-lipoid combination does not yield calcium ions; the function of the protein—which seems to render the lipoid compound more sensitive, and may act by keeping it in a state of fine suspension—is apparently secondary; the compound has properties resembling those of the thrombokinase of Morawitz rather than of the prothrombin of Howell. The anticoagulants—oxalates, citrates, fluorides, hirudin, and cobra venom—act as antikinase; hirudin acts also as an antithrombin. —J. A. C.

2911. Über Blutgerinnung—II. E. Wöhlisch (*Münch. med. Woch.*, 1921, **68,** 941-3). —In 4 cases in which splenectomy was performed there resulted no disturbance of the coagulating mechanism of the blood. Stephan's contention that the spleen presides over coagulation is therefore incorrect. The change in clotting-time in 2 cases of hæmophilia produced by X-ray illumination of the spleen was so small as to be of no therapeutic value.—J. H. B.

2912. The Regulation of the Reaction of the Blood. C. L. Evans (*J. Physiol.*, 1921, **55,** 159-92).—The buffering of separated plasma (primary buffering) is contrasted with that induced in the true plasma of whole blood through the agency of the red corpuscles (secondary). The reaction of plasma, though dependent on the ratio of free to fixed CO_2, is not wholly determined by this, but also by the other salts present, which lower the reaction by P_H 0·3. The effect of plasma proteins as buffers is negligible in practice. A slight modification of the Hasselbalch formula, with the use of values for $P.K_1$., derived from observations made on plasma, allows of the calculation of the reaction of a plasma from the usual data. The CO_2 reaction curves for plasmata of varying bicarbonate content are parallel to one another, while the P_H at a given CO_2 pressure varies directly as the log. of the bicarbonate content as for bicarbonate solutions; these relations are much less accurately maintained when whole blood is dealt with, first, because of differences in the extent and range of the secondary buffering; secondly, because of capricious post-mortem changes in the corpuscles. Blood of high Hb or of low bicarbonate content has a flatter CO_2 reaction curve than that in which either or both of these proportions is reversed. When a blood shows a reduction of CO_2 capacity on standing, this change affects the corpuscles more than the true plasma, which tends to maintain a constant bicarbonate content at a given CO_2 pressure; this is yet another instance of the operation of secondary buffering in all circumstances which otherwise would tend to lower the P_H of the blood (plasma). Plasma, blood and bicarbonate solutions alike are more alkaline at higher than at lower temperatures.—C. L. E.

2913. Regulation of the Blood's Alkalinity. J. B. S. Haldane (*J. Physiol.*, 1921, **55,** 265-75).—Ingestion of NH_4Cl, 5 to 55 gm., in man causes a fall in the alveolar CO_2 and in the blood CO_2 capacity, and a rise in the acid, NH_3, and phosphate of the urine. The depression of the alveolar CO_2 is roughly proportional to the rate of excretion of acid plus NH_3. The ratio of acid to NH_3 depends on the amount of phosphate available for excretion, and this amount falls as the " acidosis " progresses. The various effects

are probably due to conversion of part of the NH_4Cl into urea, thus freeing the HCl.—C. L. E.

2914. Study of Transfused Blood. I. The Periodicity in Eliminative Activity shown by the Organism. II. Blood Destruction in Pernicious Anæmia. Winifred Ashby (*J. Exp. Med.*, 1921, **34,** 127-46, 147-66).—I. The method used consisted in transfusing a blood of group IV. into recipients of unlike groups, and tracing the transfused cells by the author's method (Abstract No. 721, Vol. IV., p. 115). The cells are eliminated by a blood-destroying activity of the body, which is periodic both in men and in women, and in the latter coincident with the menstrual periods. II. In pernicious anæmia, contrary to current views, periods of active blood destruction are the exception, and when seen during a series of transfusions are due to the activity of the blood-destroying organs rather than to any intrinsic weakness of the patient's own corpuscles. There is no hæmolytic toxin demonstrable, and it is questionable whether blood destruction is as important a factor in the production of pernicious anæmia as is usually assumed.—C. L. E.

2915. Iron and Arsenic as influencing Blood Regeneration following Simple Anæmia. VI. Negative Influence of Familiar Drugs on the Curve of Hæmoglobin Regeneration following Hæmorrhage. G. H. Whipple and F. S. Robscheit (*Arch. Int. Med.*, 1921, **27,** 590-603).—Iron and arsenic in familiar forms have no value in promoting regeneration of hæmoglobin in anæmia due to hæmorrhage in dogs.—J. H. B.

2916. Respiration and Circulation in the Cat. II. The Effects of Hæmorrhage and Transfusion of Gum Saline Solution. Y. Doi (*J. Physiol.*, 1921, **55,** 249-52).—After hæmorrhage the oxygen intake, and the minute output of the heart are reduced, and frequency of pulse and respirations are increased. Oxygen intake and circulation rate are restored to normal by saline or gum saline infusions, the effects of the latter being the less transient.—C. L. E.

2917. Über die Bestimmung des Adrenalins in der Nebenniere und der Harnsäure im Blute. W. Autenrieth and H. Quantmeyer (*Münch. med. Woch.*, 1921, **68,** 1007-8).—The best method of estimating uric acid in blood is to precipitate the acid with silver lactate magnesia mixture.—J. H. B.

2918. The Blood-Urea Nitrogen in Acute Intestinal Obstruction. H. W. Louria (*Arch. Int. Med.*, 1921, **27,** 620-8).—In 7 cases of acute intestinal obstruction there was a high urea nitrogen in the blood. Lowest was 0·054 and highest was 0·17%.—J. H. B.

2919. Estimation of Calcium and Magnesium in Small Amounts of Serum. B. Kramer and F. T. Tisdall (*J. Biol. Chem.*, 1921, **47,** 475-81).—In 1 to 2 c.c. of serum, Ca and Mg may be estimated to within ±5% by a simple and rapid method, the technique of which is fully described. The Ca is precipitated as oxalate and the Mg in the supernatant fluid.—W. D. H.

2920. Les variations de la teneur du sang et des humeurs en sodium et en potassium après ingestion des sels de sodium et potassium. L. Blum, E. Aubel, and R. Hausknecht (*Compt. rend. soc. biol.*, 1921, **85,** 498-500).—The composition of blood and ascitic fluid can be varied as regards their content of Na and K by the sodium and potassium in the diet.—J. H. B.

2921. Micro-dosage de l'oxyde de carbone dans le sang. M. Nicloux (*Bull. soc. chim. biol.*, 1921, **3,** 286-96).—The author's method can be modified so as to deal with 2 c.c. of blood. The micro-eudiometer used was controlled by the larger apparatus, and the two give very concordant results. The application of the instrument to determine the maximum absorption capacity of the blood for CO and to ascertain the toxic coefficient is described.—W. D. H.

2922. Physiology of the Blood in Infancy and Childhood. W. P. Lucas (*J. Amer.*

Med. Assoc., 1921, **77**, 332-8).—A review of the morphology and development, chemistry and coagulation of the blood, of the phenomena of acid intoxication, of the blood-volume and circulation rate, etc., but apparently without any special reference to the conditions in children.—C. L. E.

2923. Distribution of Calcium and Phosphoric Acid in the Blood of Normal Children. M. R. Jones and L. L. Nye (*J. Biol. Chem.*, 1921, **47**, 321-31).—The blood-corpuscles of normal children are richer in all types of phosphoric acid compounds than the plasma. The average Ca content of corpuscles was found to be slightly less than that of the plasma. No relation between the alkali reserve and the concentration of Ca and P_2O_5 in the blood can be established. There are slight differences between the corpuscles of boys and girls.—H. E. R.

2924. Über den Chloridgehalt des Serums beim Säugling. K. Scheer (*Jahr. f. Kinderheilk.*, 1921, **94/44**, 295-314).—The chloride content in the serum of sucklings is fairly constant, and about 0·50 to 0·59%. At the beginning of digestion the chloride decreases quickly, and regains its former level afterwards. This connection between the serum chloride and the secretion of gastric juice is quite independent of the kind of food. Infusion of isotonic dextrose solution effects a diminution of the serum chlorides of some hours' duration.—H. W.

HEART

2925. Consecutive Phases of the Cardiac Cycle. I. The Duration of the Consecutive Phases of the Cardiac Cycle and the Criteria for their Precise Determination. II. The Laws governing the Relative Durations of Ventricular Systole and Diastole. C. J. Wiggers (*Amer. J. Physiol.*, 1921, **56**, 415-59).—Determinations by optical pressure curves give the following results: The cessation of the inflow from the auricle allows the A-V values to float into apposition; the rise of intraventricular pressure when the ventricle begins to contract then closes them firmly, and the ventricle continues to *contract isometrically* until the semilunar valves open. This phase lasts for 0·048 to 0·05 sec. The second phase is that of *maximum ejection*, lasting from the opening of the semilunar valves to the time at which the aortic pressure begins to fall owing to the inflow from the ventricle becoming less than the outflow to the periphery. The third phase is that of *reduced ejection* to the end of systole. The duration of these 2 latter phases vary considerably. The fourth phase, the *first of the diastolic period*, lasts for 0·022 sec., and ends when the semilunar valves close. The fifth phase is that between the closure of the semilunar valves and the opening of the A-V valves. It is one of *isometric relaxation*, since no blood enters. It lasts for 0·048 to 0·05 sec. The period of *rapid filling* constitutes the sixth phase, and has the same duration as the fifth phase. A period of *reduced filling* (seventh phase) follows when the cycle is long and the auricular pressure normal. It depends on the total length of diastole. An eighth phase, due to filling by the *auricular systole*, may be added. This does not continue until the end of auricular systole; the terminal period of this exerts no dynamic effect. The factors determining the duration of systole are as follows: Increase in venous inflow causes lengthening, independent of length of diastole, by prolongation of the ejection phases. Increase in arterial resistance shortens systole by shortening the ejection phases. When this resistance is such that the ventricle cannot empty, the resulting increase in initial pressure tends to lengthen systole; so that there are 2 opposing influences whose resultant depends on the nature of the resistance. If this is aortic stenosis, large volumes of blood are retained in the ventricle and the systole lengthens. The duration of systole is determined by the length of the previous diastole only when

the initial intraventricular pressure and the aortic pressure at beginning of diastole remain nearly constant.—W. M. B.

2926. Über Herzgrösse, Blutdruck und Puls vor, während und nach kurzdauernder starker körperlicher Arbeit. O. Bruns (*Münch. med. Woch.*, 1921, **68,** 907-8).—Observations on the size of the heart as seen by X-ray illumination during short periods of heavy work. The author failed to get any appreciable increase in heart volume when the blood-pressure rose 30 or 40 mm.; he points out that this is in complete contrast to the results of animal experiments carried out by Starling and Straub. He considers that the discrepancy is due to the difficulty of standardising conditions when dealing with human subjects, and, moreover, amongst other things. to the inotropic influence of the sympathetic.—J. H. B.

2927. The Determination and Significance of the Electrical Axis of the Human Heart. F. R. Dieuaide (*Arch. Int. Med.*, 1921, **27,** 558-70).—A discussion of the methods of determining the line along which the resultant of the electrical forces acting in the heart at any instant is directed.—J. H. B.

2928. Über das Verhalten des Electrocardiograms bei Verkürzung der Herzkontraction. R. Mandelbaum (*Deutsch. Arch. f. klin. Med.*, 1921, **136,** 154-8).—In cases of extra-systoles no shortening of the electrocardiogram was found. But in cases of shortening of the systole by other causes (acceleration, arrhythmia perpetua) the electrocardiogram was shortened in about half of the investigated cases in the same degree as the duration of the systole.—H. W.

2929. Studies on the Responses of the Circulation to Low Oxygen Tension. III. Changes in the Pacemaker and in Conduction during Extreme Oxygen want as shown in the Human Electrocardiogram. C. W. Greene and N. C. Gilbert (*Arch. Int. Med.*, 1921, **27,** 517-57).—A number of subjects were exposed to steadily diminishing oxygen pressures, and an investigation made of changes in the E.C.G. The authors arrive at the following conclusions: During the increased rate produced by O_2 deficiency, conduction and the process of contraction are hastened; during extreme O_2 want, conduction is suppressed; in extreme O_2 want, rhythm is originated in the A-V node and not at the sinus —J. H. B.

2930. The Bigeminal Pulse in Atrioventricular Rhythm. P. D. White (*Arch. Int. Med.*, 1921, **28,** 213-9).—A case in which block occurred between sinus and auricles is reported. During observation over a few weeks the atrioventricular node acted for a time as pacemaker, and in the electrocardiogram were seen cases of 1 auricular beat sandwiched between 2 ventricular responses. The explanation given is that the impulse backwards to the auricles travelled so slowly that a ventricular response was able to follow (as a consequence of) this auricular response, as well as to precede it.—J. H. B.

2931. Über die anatomische Beschaffenheit der Überleitungsgebilde des Kaltblüterherzens. E. v. Skramlik (*Zeit. f. d. ges. exp. Med.*, 1921, **14,** 246-81).—The heart of cold-blooded animals is a muscular continuum. The sinus-ostium ring, the A-V bundles, and the beginning of the bulb, which form connecting-links with other parts of the heart, are arranged orbicularly, and consist throughout of circular fibres which are separated by connective tissue without interrupting the muscular connection. These muscle cells of the conducting tissue are histologically identical with the other heart muscle fibres, and not different, as in the heart of warm-blooded animals.—H. W.

2932. Über humorale Übertragbarkeit der Herznervenwirkung—I. O. Loewi (*Pflüger's Arch.*, 1921, **189,** 239-42).—If the fluid with which a frog's heart is perfused is collected during a period over which the heart is inhibited by stimulation of the vagus, this perfusate will produce on a normal heart effects similar to those of vagus stimulation. Similarly, after stimulation of the accelerators (heart atropinised) the perfusate will cause acceleration of a normal heart. The author believes that inhibition

and acceleration may be due to the production of specific substances (by no means a new idea).—C. L. E.

2933. Determination of the Blood Circulating through the Coronary Arteries. J. G. D. de Barenne (*Werk. v.h. Gen. t. Bev. v. Nat. Gen. en Heelkunde.*, 2nd Ser., Deel 10, 1921, 64).—See Abstract No. 2565, Vol. VI., p. 370.—W. D. H.

2934. I. Recherches sur l'action de la compression oculaire dans la dissociation auriculo-ventriculaire complète. II. Action de l'ésérine dans la dissociation auriculo-ventriculaire complète. III. Action de l'ésérine dans la fibrillation auriculaire. D. Danielopolu and V. Danulesco (*Compt. rend. soc. biol.*, 1921, **85,** 534-40).—I. Ocular compression can only produce ventricular slowing when the ventricle is taking its beat from the auricle. An idioventricular rhythm is unaffected by vagus stimulation. II. Eserine has an inhibitory action on the sino-auricular node, producing auricular slowing. It excites the apparatus which leads to the production of an idioventricular rhythm. III. Eserine given to a patient in whom fibrillation had been reduced by digitalis increased the heart-rate from 80 to 110. Binocular compression increased it still further to 200. This is taken to indicate a further proof of the power of eserine to stimulate the idioventricular centres.—J. H. B.

2935. Substitution of K-Ions by Uranyl-Ions in the Perfusion of the Surviving Rabbit's Heart. E. T. Jannink and T. P. Feenstra (*Ned. T. v. Gen.*, 1920, **64,** 1406).—The earlier publications of Zwaardemaker's laboratory have shown that in the frog's heart K can be replaced by uranyl nitrate. Rabbits' hearts were perfused with a K-free Ringer's solution by Langendorff's method; they came to a standstill within a very short time. In the beginning of the perfusion the contractions are strengthened for a moment, but then they weaken. Uranium substitution (U-nitrate, 30 mg. per litre) makes the Ringer's liquid perfect again. If the heart was first perfused by an uranium-containing liquid, a substitution by ordinary Ringer's solution is impossible; the heart's contractions cease, but begin again after perfusion with a K-free Ringer's solution. The cause of this probably lies in the antagonism between the α-rays of uranium and the β-rays of potassium.—R. B.

2936. Recent Radiation Experiments with the Heart. H. Zwaardemaker (*Werk. v.h. Gen. t. bev. v. Nat. Gen. en Heelkunde.*, 2nd Ser., Deel 10, afl. 1, 1921, p. 50).—The frog's heart, when perfused with Ringer's liquid, shows an automatism proceeding from the atrioventricular border. If the potassium is omitted in the perfusion liquid the heart soon comes to a standstill, and the addition of K or another radio-active atom is necessary to make it beat again. A radiation with substances like mesothorium, radium, or polonium has the same effect. This radiation stimulates the heart directly. It is indifferent whether the heart is hit by positive or negative charged particles, but when it is hit at the same time or with a short interval by both the radiation has no effect. The corpuscular radiation probably has only a catalytic action, whilst the nature of the process which is brought into movement is determined by the nature of the system. —R. B.

2937. Influenza dell' alcool sulla funzione del cuore. G. Patania (*Arch. di fisiol.*, 1920, **18,** 67-85).—The action of ethyl alcohol on the heart manifests itself with a slackening of its ryhthm. This is due to a prolongation of the systolic phase when small doses are used, and to a prolongation of the diastolic phase with large doses. The excitability of the myocardium is constantly increased by small doses of alcohol, but this is less apparent as the doses increase until excitability may be diminished, with a corresponding elevation of its threshold. The latent period is shortened by minimal doses of alcohol; somewhat larger ones do not appear to have always the same effect. The length of the refractory period did not show any perceptible modification. The excitability threshold of the vagus is increased by alcohol. Under the influence of

alcohol, the heart stopped by means of vagus stimulation restarts its activity more slowly than in normal conditions.—C. d. F.

2938. Eine einfache Methode zum Studium der Dynamik des Herzmuskelstreifens und des ganzen Herzens. J. Machiela (*Zeit. f. d. ges. exp. Med.*, 1921, **14,** 130-6).—The method described can be carried out with simple means, but has the same exactness as the more complicated apparatus of Schönlein, Kries, etc., for the skeletal muscle. The method enables one to draw a parallel between the skeletal and heart muscle, both qualitatively and quantitatively.—H. W.

2939. Sur l'anaphylaxie du cœur isolé du lapin. C. Heymans (*Compt. rend. soc. biol.*, 1921, **85,** 419-20).—Rabbits were given 2 injections each of 2 c.c. of 5% Witte's peptone subcutaneously, the injections being separated by 5 days. The isolated heart was then perfused 8 days later with cobra venom in Tyrode solution at a strength of 1 in 1,000,000. Systolic arrest took place in 4 minutes, as compared with 35 minutes for the heart of a normal rabbit.—J. H. B.

2940. Klinische und experimentelle Beobachtungen über die Herzwirkung des Chinidins. E. Boden and B. Neukirch (*Deutsch. Arch. f. klin. Med.*, 1921, **136,** 181-91).—The clinical effects of quinidine in cases of irregularity of the heart are especially well seen in cases of extra-systole and paroxysmal tachycardia. The influence on absolute irregularity is uncertain. Experiments on isolated hearts of rabbits showed that the drug causes a lowering of excitability in such a way that flutter cannot be produced. The size of the contractions decreases. An elective damage of heart tissues occurs. The sinus node loses first its influence on the heart, then the atrium and centres of the ventricle take on the work of pacemaker. Constant disturbances of conduction are observed (elongation of the P-R interval, etc.). The changes in the heart-beat and electrocardiogram by quinidine are reversible; Ca partly counteracts its effects. The coronary bloodvessels are first enlarged.—H. W.

2941. Paroxysmal Tachycardia, with Reference to Nomotopic Tachycardia and the Rôle of the Extrinsic Cardiac Nerves. A. M. Wedd (*Arch. Int. Med.*, 1921, **27,** 571-90).—A report of 6 cases.—J. H. B.

CIRCULATION

2942. Inscription du pouls différentiel entre deux membres chez l'homme. J. L. Pech and A. Quinquand (*Bull. de la soc. de sci. méd. de Montpelier*, 1921, **5,** 215-8).—The 2 limbs are surrounded by inflatable armlets, connected by tubes to the tambour of a recording apparatus so arranged that pressure from one armlet balances that from the other; the armlets are slightly inflated. If the changes in pressure produced by the passage of the pulse-wave are produced simultaneously and equally in the 2 armlets, no movement of the writing stylet results; any inequality produces a "differential pulse-tracing." Diagrams of such tracings are shown, and shortly discussed. Many of the variations revealed by this method are not shown by electrocardiographic examination.—E. P.

2943. Die mittlere Durchflussmenge der Arterien des Menschen als Funktion des Gefässradius. R. Thoma (*Pflüger's Arch.*, 1921, **189,** 282-310).—A mathematical investigation.—C. L. E.

2944. The Physiology of the Veins. J. F. Donegan (*J. Physiol.*, 1921, **55,** 226-45).—The veins (dog, cat, rabbit) can be roughly divided into 3 groups: (*a*) Superficial veins returning blood from the skin. These receive sympathetic nerve fibres. The veins of the hind-limb receive them from the 2nd to the 4th L. nerves inclusive, but chiefly by way of the 7th L. and 1st S. ganglia; those of the fore-limb from the 6th to the

8th D., with cell stations mainly in the stellate ganglion. They react differently in different individuals; in some they contract on the first weak nerve stimulation, in others they only contract after repeated stimulation. These veins were not found to react in the usual vascular reflexes, but probably they take part in temperature reflexes. (*b*) The mesenteric veins. These are supplied with sympathetic nerves having their cell stations in the ganglia of the solar plexus and the inf. mesenteric ganglion. They are influenced reflexly in the same way as the arterioles. (*c*) The veins from the muscles and the vena cava. No effect was found in these. Adrenaline 1 in 1,000,000 causes marked contraction in the veins of groups (*a*) and (*b*), but is practically inert in those of group (*c*).—J. A. C.

2945. Über die Wirkung kleinster Säure- und Alkalimengen auf die Gefässe und andere glattmuskelige Organe. P. Heymann (*Arch. exp. Path. Pharm.*, 1921, **90,** 27-76).—A review of the work of others and the results of the author's own experiments on the Pissemski preparation of the isolated rabbit's ear and the Trendelenburg preparation of the vessels of a frog. The main conclusions are that very small quantities of acids and alkalis cause vaso-constriction, and that simultaneously the tissues become œdematous, but the vaso-constriction and the œdema are not proportional.—J. H. B.

2946. Die Wasserstoffionenkonzentration als peripher regulatorisches Agens der Blutversorgung. A. Fleisch (*Zeit. f. allg. Physiol.*, 1921, **19,** 269-334).—Various small mammals were perfused at constant pressure with saline solutions of known hydrogen-, bicarbonate-, and phosphate-ion concentration, the rate of flow being graphically recorded by the author's differential Stromuhr (Abstract No. 1439, Vol. V., p. 231). Clear evidence of the sensitiveness of the vessels to a small increase of H-ion concentration is given, and it is further shown that CO_2 has no specific action, but acts in virtue of the alteration of [H]· which it produces. A vaso-dilatation may be effected also by changing the perfusion fluid for a solution of the same reaction, but more feebly buffered, because in that case the acids produced in the tissues themselves become locally effective. It was found that vaso-dilatation occurred when the outgoing perfusion liquid had a $C_H = 0{\cdot}05 \times 10^{-7}$ higher than the ingoing. The acid dilatation *in vivo* is not due to a paralysis of the plain muscle by CO_2, because if CO_2 is given by artificial respiration there is a powerful vaso-constriction due to action on the vasomotor centre. The latent period of response of the vessels to altered C_H is about 2 to 2·5 secs.—C. L. E.

2947. Acção da temperatura sobre a velocidade de formação dos edemas experimentaes. M. O. de Almeida (*Brazil medico*, Nov. 27, 1920).—L'œdème qui se montre dans la patte de la grenouille lorsqu'elle est liée au-dessus du genou (expérience de M. Fischer) se forme beaucoup plus rapidement lorsque la température de l'eau, dans laquelle est plongé l'animal, est élevée. Ce fait explique l'observation que dans les époques chaudes l'œdème est déjà visible deux ou trois heures après la ligature.—M. O. A.

RESPIRATION

2948. Respiratory Efficiency in Health and Disease. M. Flack (*Lancet*, 1921, ii., 593-9, 637-41, 693-6, 741-4).—These 3 lectures (Milroy Lectures) treat fully the subject named in title. The author is well known for his work on the testing of airmen, etc. for efficiency.—W. D. H.

2949. Polypnéa thermica e reflexos de Hering e Breuer. M. O. de Almeida (*Brazil medico*, Aug. 21, 1920).—Les réflexes de Hering et Breuer produits par l'insufflation des poumons ne sont pas obtenus chez les chiens en polypnée thermique. Dans la petite polypnées réflexe, ils peuvent encore se montrer, quoique réduits. Dans la grand polypnée centrale, ils n'ont jamais été obtenus.—M. O. A.

2950. Responses of the Circulation to Low Oxygen Tension. V. Stages in the Loss of Function of the Rhythm-producing and the Conducting Tissue of the Human Heart during Anoxæmia. C. W. Greene and N. C. Gilbert (*Amer. J. Physiol.*, 1921, **56,** 475-86).—Reflex muscular control may persist in man for 6 to 8 secs. after loss of consciousness from anoxæmia by rebreathing. The site of the sino-auricular rhythm passes by steps to a lower point, and ultimately to what appears to be the A-V node. Internodal conduction is finally lost. The ventricular rhythm is persistent and regular during the post-crisis stage. The series of changes is parallel to those in experimental animals under general asphyxia.—W. M. B.

2951. Carbon Monoxide Asphyxia. I. Effect on the Heart. H. W. Haggard (*Amer. J. Physiol.*, 1921, **56,** 390-403).—Formation of COHb causes anoxæmia, hence excessive breathing and respiratory failure from loss of CO_2. Heart block then develops, and the cardio-inhibitory centre lasts longer than the respiratory. If CO_2 is also given, there is no evidence of impairment of A-V conduction. Illuminating gas causes respiratory failure more quickly than CO. Electrocardiograms of 2 exceptional dogs are given.—W. D. H.

2952. The Effects of Respiration of Oxygen on Breathing and Circulation. L. Dautrebande and J. S. Haldane (*J. Physiol.*, 1921, **55,** 296-9).—Respiration of pure oxygen, particularly at increased barometric pressure, produces a fall in alveolar CO_2 pressure and diminishes the pulse-rate. It is presumed that these effects are brought about by slowing of the blood-flow through the tissues, which are thus protected against the poisonous action of the high oxygen pressure.—J. A. C.

2953. The Relation of the Migration of Ions between Cells and Plasma to the Transport of Carbon Dioxide. E. A. Doisy and E. P. Eaton (*J. Biol. Chem.*, 1921, **47,** 377-93).—*In vitro* experiments on ox blood equilibrated with various tensions of CO_2 show that the loss of chloride equals the gain in bicarbonate of serum, that no appreciable amounts of Na or K pass from cells to serum, and that the corpuscles increase in volume with increasing tensions of CO_2.—H. E. R.

2954. Hæmato-Respiratory Functions. XII. Respiration and Blood Alkali during Carbon Monoxide Asphyxia. H. W. Haggard and Y. Henderson (*J. Biol. Chem.*, 1921, **47,** 421-32).—Blood alkali is decreased owing to acapnia and not to acid production. Lack of oxygen causes overbreathing, and does not by itself cause an increased production of organic acids.—H. E. R.

2955. The Acapnia Theory Now. Y. Henderson, H. W. Haggard, and R. C. Coburn (*J. Amer. Med. Assoc.*, 1921, **77,** 424-6).—Low plasma bicarbonate may be due either to a production of fixed acids in the tissues or to acapnia followed by removal of alkali by the kidney and other tissues. During anæsthesia and surgical operation acapnia is the chief cause of the lowered bicarbonate; the consequences—constriction of skin vessels, especially the veins, deficient venous return to the heart, low arterial pressure, cyanosis, and reduced respiratory exchange—may be obviated if CO_2 loss is prevented or made good.—C. L. E.

2956. Über die Kohlenstoffabgabe des Menschen beim Fechten und Ringen. R. Gullichsen and J. L. Soisalon-Soininen (*Skand. Arch. Physiol.*, 1921, **41,** 188-94).—The CO_2 production in wrestling is greater than in foil or sabre fencing, the cal. per. kg. per hr. being respectively 12·32, 8·25, 8·67.—C. L. E.

2957. Blutgasanalysen. IX. Narkose und kolloidale Ladung. K. Meier and W. Krönig (*Biochem. Zeit.*, 1921, **119,** 1-15).—By following the curve of combination of CO_2 with corpuscles as used in previous papers, the authors show that addition of narcotics favours the neutralisation of the charge on the surface colloids of the erythrocytes. Corpuscles suspended in saline are discharged at P_H 6·67, but at the optimum concentration in the saline of methyl urethane, ethyl urethane,

and ethyl alcohol the discharge takes place at P_H 6·95, 6·90, and 6·85 respectively.—H. K.

2958. Oxygen Consumption of Amphibian Muscle and Nerve. N. K. Adam (*Biochem. J.*, 1921, **15,** 359-62).—In resting tissues at N.T.P. the rates of respiration are, per hour: Sartorius 0·10 to 0·135, gastrocnemius 0·05 to 0·12, sciatic 0·05 to 0·08 c.c. per gm. In resting muscles, owing to damage in excision, the rate is at a higher level for an hour or so, then is constant for about 24 hours. Stimulated muscle has a 40% increase for 2 hours. There is practically no " delayed consumption " in stimulated nerve. The resting respiration may be a compensating anabolic process proceeding *pari passu* with survival formation of lactic acid. The author was not successful with Tashiro's (1913) method for estimating small quantities of CO_2.—J. A. H.

ALIMENTARY CANAL

2959. Azione di alcuni stimoli gustativi sulla velocita di secrezione e sul potere amilolitico della saliva parotidea umana. T. de Sanctis-Monaldi (*Arch. di fisiol.*, 1920, **18,** 168-70).—The velocity of secretion of parotid saliva is increased by various stimuli such as bread, meat, and acid. Its amylolytic power, however, remains unchanged, and does not appear to be influenced by any of the usual stimuli.—C. d. F.

2960. Secretion of the Pars Pylorica Gastri. A. C. Ivy and Y. Oyama (*Amer. J. Physiol.*, 1921, **57,** 51-60).—The pyloric secretion collected in a stomach pouch (dogs) is alkaline, viscid, and free from enzymes. It is simply mucus. Microscopic study supports this view.—W. D. H.

2961. Die Magensecretion beim Menschen unter besonderer Berücksichtigung der psychischen Einflüsse. I. Saftmenge und eiweissverdauende Kraft. G. R. Heyer (*Arch. f. Verdauungskrankh.*, 1921, **27,** 227-40).—To avoid error the experiments were made on persons in deep hypnosis, and the gastric juice was abstracted by a sound. The consequence of suggested feeding was the abundant secretion of gastric juice after a latency of some minutes, and lasting for an hour. The juice was collected in 5-minute periods, and its quantity, acidity, and pepsin content were determined. The results are given in curves. These curves were different according as the suggested feeding consisted of bread, milk, or beef gravy. Pavloff's results on dogs are compared with these.—H. W.

2962. H-Ion Concentration in the Contents of the Small Intestine. J. F. McClendon (*Proc. Nat. Acad. Sci.*, 1921, **6,** 690-1).—The author finds for the contents of the small intestine obtained by the duodenal tube values of the P_H from 4·7 to 6·2. (Compare Abstract No. 569, Vol. V., p. 89, and Abstract No. 352, Vol. VI., p. 54.)—W. D. H.

2963. The Influence of Free Fatty Acids in the Intestinal Contents on the Excretion of Calcium and Phosphorus. S. V. Telfer (*Biochem. J.*, 1921, **15,** 347-54).—In complete exclusion of bile from the gut over 70% of the dried fæces may consist of fatty derivatives. The non-absorption of an excess of fatty acids in the intestine is associated with a modification of the normal excretion of Ca and P. The Ca is found in the fæces in the form of a large excess of soaps, whilst the P thus liberated from combination with Ca is absorbed and excreted by the urine.—J. C. D.

2964. Investigation of Gastro-Intestinal Secretion. E. C. Dodds (*Lancet*, 1921, ii., 605-6).—A brief note drawing attention to the author's method, previously alluded to in these abstracts (Abstracts Nos. 1310, 1312, Vol. VI., p. 195). By taking samples of the alveolar air he finds that the CO_2 tension undergoes definite changes in response to the amount of secretion formed in the stomach and intestine.—W. D. H.

2965. Studio isto fisiologico di due fistole intestinali alla Thiry nello stesso can.

A. D. Volta (*Arch. di fisiol.*, 1920, **18,** 97-134).—The author thoroughly examined 2 Thiry's fistulæ which had been carried out on the same dog 5 years before, and had never been affected by any external morbid agent. The isolated segments of intestine were found to be functionally and anatomically normal, while their blind ends showed regenerative phenomena which had extended to the mucous, submucous, and muscular coats without leaving any scar or trace of the operation.—C. d. F.

2966. Über physiologische und pharmakologische Versuche am Rektum des Frosches. J. Schüller (*Arch. exp. Path. Pharm.*, 1921, **90,** 196-241).—A preparation of the "frog rectum" is described, consisting of all the intestine below the small intestine with the exception of the first (ampullary) wider portion normally found containing fæces. In this way a "cord-like" piece is obtained 10 to 20 mm. long. If examined in a normal frog *in situ* it is quiescent. But if separated from nervous connections by cutting off the mesentery it will give regular spontaneous contractions at intervals of 40 to 60 secs. It contracts down into the pelvis, and then slowly relaxes. When excised, it will exhibit spontaneous contractions for several hours. The tracings shown in the paper are very striking in their uniformity and regularity. The responses obtained with this preparation are in many respects similar to those of cardiac muscle (refractory period, obedience to the "all-or-nothing" law, staircase phenomenon, etc.). The effect of drugs is similar to that on other parts of the intestine.—J. H. B.

2967. La secrezione della bile nell' uomo—I. and II. B. Brunacci and U. Noferi (*Arch. di fisiol.*, 1920, **18,** 135-51, 153-65).—I. A woman of 60 years of age, operated on (cholecystostomy) 2 months before the beginning of the investigation, voluntarily lent herself for this research. The results were: While the subject was fasting, but receiving an unlimited supply of drinking water, bile was continuously secreted, and in a quantity only slightly inferior to the amount collected after carbohydrate meals. After the ingestion of fats, and chiefly of proteins, an abundant secretion of bile was noticed. During fasting the amount of bile increased slowly during the first hours of the day, reached a maximum after 12 to 16 hours, and then began to decline progressively till the end of the experiment (24 hours). When food was administered, the maximum of secretion was reached much sooner—*i.e.*, within the first 4 hours of the day, and as a rule shortly after the taking of meals. The influence of ingested fat on the secretion of bile ends within 24 hours; that, due to the ingestion of proteins, continues over the next day. The quantity of ingested water appears to be without influence on the amount of secreted bile. These conclusions agree, on the whole, with those reached by other authors. II. While the subject was fasting or receiving a mixed diet the molecular concentration and electric conductivity of the secreted bile showed only small oscillations, but their highest and lowest points were reached sooner after the taking of food than after fasting. A striking parallelism was observed between the curves representing the molecular concentration and electric conductivity after the taking of mixed food and that of the body temperature. After the administration of an exclusively protein diet the cryoscopic point and electric conductivity are at their lowest, highest values being reached both after the ingestion of fats or sugar and after fasting. When the urine was examined at the same time the opposite was observed, the value of the electric conductivity growing *pari passu* with that of the specific gravity. The viscosity of the secreted bile is minimal after the ingestion of protein food, maximal after fasting. The dry residue (at 100° C.) is more abundant after a carbohydrate diet than in any other condition. The quantity of ash is greater after protein food and after fasting. Bile has probably no influence on intestinal putrefaction; the elimination of indican is in relation to the total amount of N eliminated in the urine. The amount of N found in the bile was always very small.—C. d. F.

2968. Der Sekretionsdruck der Galle beim Menschen. W. Robitschek and M. Turolt

(*Wien. klin. Woch.*, 1921, **34,** 263-4).—The bile in men ascends a vertical glass tube in connection with the ductus hepaticus to the height of 210 to 270 mm. This height depends upon the secretory power of the liver cells, on the intra-abdominal pressure, and on the state of contraction of the muscles of the gall-bladder. Physostigmine and pilocarpine increase, papaverine diminishes, this pressure.—H. W.

2969. Cholecystogastrostomy and the Courvoisier Gall-Bladder. C. G. Heyd (*J. Amer. Med. Assoc.*, 1921, **77,** 339-42).—The operative union of gall-bladder and pylorus is more successful than any other anastomosis between gall-bladder and alimentary canal, and the presence of bile in the stomach is no hindrance to gastric digestion.—**C. L. E.**

FOOD AND DIET

2970. The Nutritive Properties of Milk in the White Mouse. H. A. Mattill (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 242-3).—White mice on a diet consisting of dried whole milk 93%, salt mixture 2%, and yeast 5%, have reproduced to a fourth generation. Animals on this food without yeast become pregnant, and young are born, but they are small and usually die within 3 or 4 days.—D. H. de S.

2971. Die Verdauungsleukocytose beim Säugling. L. Adelsberger (*Zeit. f. Kinderheilk.*, 1921, **29,** 156-89).—After drinking human milk a leucopenia quickly occurs. On the other hand, artificial nutrition mixtures cause after some time a considerable leucocytosis. The bacterial flora in the intestine of sucklings, although showing many differences from the adult and from those fed on cow's milk, has no connection with the leucopenia or the leucocytosis. The ferments of the human and cow's milk do not change the reaction of the leucocytes (investigations with cooled and fresh milk). Leucocytosis also occurs after nutrition with fat and carbohydrates.—H. W.

2972. Nutrition. VIII. Proteins of Tomato Seed Press Cake. A. J. Finks and C. O. Johns (*Amer. J. Physiol.*, 1921, **56,** 404-7).—A diet in which this formed the sole source of N and water-soluble vitamin enabled albino rats to grow normally. The diet was made adequate by starch, inorganic salts, and butter. Lard did equally well instead of butter.—W. D. H.

2973. Nutrition. IX. Proteins of Chinese and Georgian Velvet Beans. A. J. Finks and C. O. Johns (*Amer. J. Physiol.*, 1921, **57,** 61-7).—The proteins of both beans coagulated by heat are adequate for growth (albino rats). The Chinese product prepared by dialysis is not (whether or not cystine is added). Bean-meal cooked, autoclaved, and supplemented by either cystine or casein, leads to nutritional failure and death. This is more probably due to an associated toxic substance (dehydroxyphenylalanine ?) than to protein toxicity.—W. D. H.

2974. Studies on the Digestibility of Proteins in Vitro. II. The Relative Digestibility of Various Preparations of the Proteins from the Chinese and Georgian Velvet Beans. H. C. Waterman and D. B. Jones (*J. Biol. Chem.*, 1921, **47,** 285-95).—Partial indigestibility is the limiting factor in the failure of raw dialysed Chinese velvet bean protein to promote growth. The digestibility can be raised by cooking or coagulation. The raw ground meal has the double disadvantage of toxicity and indigestibility.—J. C. D.

2975. Fructose. A. Daniel (*Chem. Ztg.*, 1921, **45,** 4-5).—Fructose has the following advantages as a foodstuff over sucrose: It is absorbed directly and assimilated to a larger extent than sucrose; it is oxidised much more quickly than either cane-sugar or dextrose, and in larger amounts in equal time intervals. The abundant formation of CO_2 is important in the treatment of tuberculosis and other affections. Fructose also effects a saving in fats and protein. It can be readily manufactured in sugar factories

from chicory roots, which give good yields per acre. The exhausted chips and the leaves may be used for feeding and other purposes.—W. D. H. (*Chem. Abstr.*).

2976. Green Feed versus Antiseptics as a Preventive of Intestinal Disorders of Growing Chicks. A. G. Philips, R. H. Carr, and D. C. Kennard (*J. Agric. Res.*, 1921, **20,** 869-73).—160 White Leghorn day-old chicks were used. Weight and mortality data, the average protein consumption, and the amount and distribution of fæces N are given. N soluble in 0·1 *N* HCl is calculated as urea, ammonia, and amino-acid N. The N insoluble in 0·1 *N* HCl is called uric acid and residual N. Straw, straw plus greens, HCl, tobacco, sulphur, lactose, and $CuSO_4$ were all added to the basal diet, which consisted of 50 parts cracked corn, 35 parts corn meal, 15 parts corn bran, 3 parts ash, 8·86 parts meat scrap, and 10·9 parts soy-bean meal. Tops of sprouted oats seemed to be valueless as a preventive of digestive disorders or as an aid to the growth of chicks in confinement. Less uric acid was found in the fæces from the chicks given HCl and tobacco powder than in the other cases. Tobacco powder prevents the normal growth of chicks and causes them to be wild and nervous. HCl, S, and particularly $CuSO_4$, offer interesting possibilities of success in raising chicks in confinement.—W. D. H.

2977. Einfluss organischer Säuren auf die Bildung und Reifung des Zuckerhonigs. E. Sarin (*Biochem. Zeit.*, 1921, **120,** 259-64).—The addition of acids to the sugar syrups used for feeding bees exerts a harmful effect on the biochemical processes of the formation and ripening of honey.—H. K.

2978. Beiträge zur Chemie der Bildung und Reifung des Bienenhonigs. E. Sarin (*Biochem. Zeit.*, 1921, **120,** 250-8).—Bees were fed with cane-sugar syrup, and the honey collected and refed to the bees. This process was repeated 3 times. Examination of the honey at each stage indicated that invertase and diastase are specific products of the bees, but that catalase, which only occurs in natural honey, is of plant origin.—H. K.

VITAMINS

2979. Nature of Vitamins. P. Portier (*Bull. Soc. Sci. Hyg.*, 1920, **8,** 521-53, 603-20).—An extensive review mainly speculative. The vitamins are regarded as having no energy value in themselves, but furnish an impetus to nutritional processes, especially in nuclear activity. This is spoken of as "nutritive fecundation."—W. D. H. (*Chem. Abstr.*).

2980. Methods of Extracting and Concentrating Vitamins A, B, and C, together with an Apparatus for reducing Milk, Fruit Juices, and Other Fluids to a Powder without Destruction of Vitamins. J. F. McClendon (*J. Biol. Chem.*, 1921, **47,** 411-20).—The preparation of the materials and the apparatus employed are fully described.—J. C. D.

2981. Vitamin A in the Peel of Citrous Fruits. E. Cooper (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 243-4).—Feeding experiments on rats show that orange peel contains the fat-soluble vitamin A. Experiments in progress indicate that lemon and grapefruit peel likewise contain it.—D. H. de S.

2982. Fat-Soluble Vitamin. VIII. The Vitamin A Content of Peas in Relation to their Pigmentation. H. Steenbock, M. T. Sell, and P. W. Boutwell (*J. Biol. Chem.*, 1921, **47,** 303-8).—Of 6 types of ripe peas investigated, those of a green colour, also containing considerable yellow pigments, were richer in vitamin A than the yellow varieties, which contain less pigments.—J. C. D.

2983. The Relation of the Fat-Soluble Factor to Rickets and Growth in Pigs. S. S. Zilva, J. Golding, J. C. Drummond, and K. H. Coward (*Biochem. J.*, 1921, **15,** 427-37).—Young pigs were reared from birth on artificial diets highly deficient in vitamin A. This deficiency caused a cessation of growth, which could be made good by adding

sources of the vitamin such as cream, cod-liver oil, or lucerne, but no definite symptoms of rickets were observed.—J. C. D.

2984. Experimental Rickets in Rats. II. The Failure of Rats to develop Rickets on a Diet Deficient in Vitamin A. A. F. Hess, G. F. McCann, and A. M. Pappenheimer (*J. Biol. Chem.*, 1921, **47,** 395-409).—Experiments with rats fed on dietaries deficient in the vitamin A show that they cease to grow and develop keratomalacia, finally dying from the effects of inanition, but in no case did such rats develop true rickets. Microscopical examination of the bones showed a certain lack of active osteogenesis. This, together with the authors' earlier work on infants (Abstract No. 207, Vol. V., p. 32), support previous results obtained by McCollum and his co-workers (Abstract No. 1519, Vol. V., p. 241) with rats, and the experiments with pigs previously described, and make it definite that deficiency of vitamin A alone is not the causative factor in rickets.—J. C. D.

2985. Experimental Rickets in Rats—I. H. C. Sherman and A. M. Pappenheimer (*J. Exp. Med.*, 1921, **34,** 189-98).—Previously published (Abstract No. 2203, Vol. VI., p. 319).—C. L. E.

2986. Studies in the Vitamin Content. II. The Yeast Test as a Measure of Vitamin B. W. H. Eddy, H. L. Heft, H. C. Stevenson, and R. Johnson (*J. Biol. Chem.*, 1921, **47,** 249-75).— The authors employed the technique described by Funk and Dubin (Abstract No. 3502, Vol. V., p. 555), with slight modifications. The results given by applying this method to the estimation of the value of foodstuffs as a source of vitamin B are only in approximate agreement with those yielded by feeding experiments. The curve obtained by plotting the determinations obtained with varying concentrations of an extract of alfalfa approximates to the logarithmic type, but in the higher concentrations there is a decline due to inhibitory factors. The authors present further evidence to that advanced by de Souza and McCollum (Abstract No. 2974, Vol. V., p. 474) and others, that the test is unreliable as a quantitative measure of vitamin content.—J. C. D.

2987. Quelques recherches sur la Vitamine B. H. Damianovich (*Compt. rend. soc. biol.*, 1921, **85,** 591-2).— Deficiency in vitamin B leads to a reduction of the amount of catalase in the liver.—J. H. B.

2988. Recherches cliniques sur la Vitamin B. C. P. Matheu (*Compt. rend. soc. biol.*, 1921, **85,** 593).—Babies with metabolic disturbances are greatly improved by the addition of vitamin B to the diet. There is increase in weight, in 1 case 5 kgm. in 1 month.—J. H. B.

2989. The Differential Dialysis of the Antineuritic and Antiscorbutic Factor. S. S. Zilva and M. Miura (*Biochem. J.*, 1921, **15,** 422-6).—By employing collodion membranes of graded permeabilities the authors have ascertained that the vitamins B and C pass membranes which permit the passage of methylene blue, neutral red, and safranine.—J. C. D.

2990. Le jus de citron sterilisé est-il antiscorbutique? G. Mouriquand and P. Michel (*Compt. rend. soc. biol.*, 1921, **85,** 470-2).—Sterilisation of lemon juice has an important influence in destroying its antiscorbutic power.—J. H. B.

2991. Du principe antiscorbutique dans le jus de pomme de terre extrait en présence d'acides. M. Bezssonoff (*Compt. rend.*, 1921, **173,** 417-9).—Potato juice obtained from the potato by pressure loses its antiscorbutic power unless the expression is carried out in the presence of tartaric acid.—J. H. B.

2992. The Effects of an Unbalanced Diet in the Production of Guinea-Pig Scurvy. G. M. Findlay (*Biochem. J.*, 1921, **15,** 355-7).—Scurvy does not develop more rapidly on a diet lacking the vitamin C when it contains an excess of protein, fat, or carbohydrate.—J. C. D.

2993. Preservation of Lemon Juice and Scurvy. Sir P. W. Bassett-Smith (*Lancet*, 1921, ii., 321-2).— The author adduces proofs (experiments on guinea-pigs) that his

lemon-juice tablets alluded to in previous abstracts retain their efficiency for over a year. They might be prepared on a commercial scale if the temperature employed for evaporation was higher, and it is *probable* this is practicable without loss of efficiency, but the author does not appear to have actually tested the point. Care is necessary, for all commercial lemon juices are not antiscorbutic. This property was lacking in some which had deteriorated, and in others preserved with potassium metabisulphite. Tinned tomatoes prevent and cure scurvy in guinea-pigs (confirmatory of Givens and colleagues).—W. D. H.

2994. Scurvy in Antarctic. A. H. Macklin and L. D. A. Hussey (*Lancet*, 1921, ii., 322-6).—An interesting account of scurvy in polar expeditions, and the precautions to be taken in the Shackleton-Bowett Antarctic expedition, by two of its prospective members. They have evidently studied and profited by recent work on vitamins, and place great hopes in Admiral Bassett-Smith's lemon-juice tablets.—W. D. H.

2995. Sur l'absence de troubles électifs du metabolisme du calcium osseux dans le scorbut expérimental. A. Morel, G. Mouriquand, P. Michel, and L. Thévenon (*Compt. rend. soc. biol.*, 1921, **85,** 469-70).—The bony changes in experimental scurvy are not related to defects of Ca metabolism.—J. H. B.

2996. Defective Diet as a Cause of Sterility. E. Reynolds and D. Macomber (*J. Amer. Med. Assoc.*, 1921, **77,** 169-75).—Rats inbred for 34 generations and of known fertility (represented by the figure 0·65) were fed on 4 deprivation diets—viz., low fat-soluble vitamin, low Ca, low protein, and "double deficiency or war diet" which was low in the last two. The mating fertility was reduced to 50, 31, 14, and for the war diet apparently to 0, and the appearance of fertility was also delayed. Mating fertility is determined by the product of the indices of individuals; thus $0{\cdot}7\times0{\cdot}7=0{\cdot}49$. When the calculated mating fertility falls below 0·45 (or 45%) reproduction does not occur. Thus $0{\cdot}8\times0{\cdot}4$ would be sterile, whereas $1{\cdot}0\times0{\cdot}5=0{\cdot}5$ would be fertile. Fertility thus depends on the indices of both partners. The alterations in general condition of the rats were not very marked, except on the double deficiency diet. Histological changes in the ovaries and testes were indefinite. There were 6 deliveries of macerated fœtuses. Brief illustrative clinical histories in man are added.—C. L. E.

METABOLISM

2997. Remarks on Standards for Normal Basal Metabolism. J. H. Means and M. N. Woodwell (*Arch. Int. Med.*, 1921, **27,** 608-19).—Notes on the accuracy of different methods in use.—J. H. B.

2998. Determination of the Basal Metabolism. J. H. Means (*J. Amer. Med. Assoc.*, 1921, **77,** 347-52).—Illustrative examples of the use of basal metabolism determinations in the diagnosis and treatment of thyroid disorders and in obesity treatment. In simple obesity, where the basal metabolism is normal, the giving of thyroid may do harm.—C. L. E.

2999. The Measurement and Standards of Basal Metabolism. F. G. Benedict (*J. Amer. Med. Assoc.*, 1921, **77,** 247-50).—A general account of the subject. At the present time more difficulty is presented by the interpretation than by the getting of results.—C. L. E.

3000. Fundamental Ideas regarding Basal Metabolism. G. Lusk (*J. Amer. Med. Assoc.*, 1921, **77,** 250-2).—A review of the formulæ proposed to relate metabolism to surface area. The formula of Du Bois is preferred for calculating surface area (Abstracts No. 211, Vol. I., p. 75; No. 1141, Vol. I., p. 324, etc.).—C. L. E.

3001. A noção do metabolismo basico e suas relações com algumas noções physio-

logicas. M. O. de Almeida (*Folha medica*, Dec. 1, 1920).—Exposé théorique qu'il est impossible de résumer.—M. O. A.

3002. Basal Metabolism in Menstruation. Marion O. P. Wiltshire (*Lancet*, 1921, ii., 388-9).—Except for slight but definite changes in temperature, no periodic changes have as yet been correlated with menstruation. Blunt and Dye, also Snell, Ford, and Rowntree, could find no change in basal metabolism. The present paper confirms this by observations on 5 subjects. A few experiments on metabolism during work did not reveal any difference in that condition.—W. D. H.

3003. The Basal Metabolism in Fever. E. F. Du Bois (*J. Amer. Med. Assoc.*, 1921, **77,** 352-7).—Heat production was measured by indirect and direct calorimetry, the results of the 2 methods showing a satisfactory agreement. Taking as a standard normal metabolism, for subjects between 20 and 40 years of age, 39·5 cals. per sq. m. p. hr., the metabolism of subjects expressed as a percentage of this was plotted against the rectal temperature. About 90% of normal men come within 10% of the standard calculated metabolism. In fever cases the metabolism at 40° C. found from the graph varies—*e.g.*, in tuberculosis +32%, in typhoid +48%, in malaria, or after foreign protein injections, as much as +60%. But in each case the graph is a straight line, and the author believes that the general similarity between the results indicates that the effect of a rise of temperature is to accelerate metabolism in accordance with the van't Hoff law. A reduced heat loss has no part in the causation of a rise of body temperature, which is always due to increased heat production. As a general rule the basal metabolism in fever may be roughly estimated as follows: The normal metabolism is calculated from surface area standards, and 13% added for each degree C. above normal (or 7·2% for each degree F.); this is increased by a further 10% in toxic cases with great destruction of body protein, and by 10% in all other febrile patients who are receiving much food. Further allowances would be necessary for restless patients.—C. L. E.

3004. The Basal Metabolism and the Specific Dynamic Action of Protein in Liver Disease. J. C. Aub and J. H. Means (*Arch. Int. Med.*, 1921, **28,** 173-91).—The liver is regarded as an unimportant regulator of metabolism, or at least it performs its functions as well in disease as normally. Utilisation of large amounts of protein was normal in the cases examined.—J. H. B.

3005. Physiological Cost of Muscular Work. J. B. Orr and J. P. Kinloch (*Brit. Med. J.*, 1921, ii., 39-40).—The authors point out sources of error in the method used by Waller and De Decker. They contend that, in estimating the cost of work from the CO_2 exhalation, results obtained at the beginning of work or immediately after the work stops are of little value. In the former case CO_2 is accumulating within the body, while in the latter it is being washed out. In neither case is there any parallelism between the production of CO_2 in the tissues and the exhalation of CO_2.—D. H. de S.

3006. Zur Kenntnis des Eiweissansatzes beim Kinde. A. Ruotsalainen (*Skand. Arch. Physiol.*, 1921, **41,** 33-76).—When protein, fat, or sugar in isodynamic amount is added to a constant basal diet of growing children, the N retention is greatest when the addition is of protein, provided the calorie intake is adequate. That there is a true increase in N retention is shown by the fact that it persists even if half the protein intake is replaced by sugar in isodynamic amount. In boys between 9 and 10 there is a positive CaO, MgO, and P_2O_5 balance when the daily intake is respectively 1·6 g., 0·5 g., and 3·2 g.—C. L. E.

3007. Ricerche sul bilancio energetico della rana in condizioni patologische. A. Azzi (*Arch. di fisiol.*, 1920, **18,** 49-66).—The total energy exchanges of normal frogs remain fairly constant if the animals are regularly fed and kept in uniform surroundings. After the inoculation of pathogenic germs frogs may fall ill and die. The energy metabolism may then vary in different ways. Sometimes it increases up to a maximum,

when it gradually diminishes until death supervenes; sometimes the increase persists, and a diminution appears only for a brief moment during agony; in yet other cases only a state of collapse characterised by a progressive decline of energy exchanges can be observed. The heat production and oxygen consumption vary in the same, though not quite parallel, way. After injections of peptone solutions frogs appear to be ill for a certain time, during which a remarkable increase in the total energy exchanges is noticed. In conclusion, in cold-blooded animals the intoxication with bacterial or derived proteins, generally considered as the principal cause of fever, alters the thermogenesis sometimes in a positive, sometimes in a negative sense, and sometimes remains without any apparent effect. The phenomenon cannot be explained by hyperpyrexia, because this is non-existent in cold-blooded animals. It is probable that morbid agents may act on thermogenic nerve centres sometimes in an exciting, sometimes in a paralysing manner.—C. d. F.

3008. The Rate of Growth of the Domestic Fowl. S. Brody (*J. Gen. Physiol.*, 1921, **3,** 765-70).—The growth period is analogous to that of the mammal, composed of 3 or 4 cycles, 2 being post-embryonic, 2 or 1 embryonic. The velocity curves can be represented by that of an autocatalytic unimolecular reaction.—W. M. B.

3009. Kohlehydratstoffwechsel beim Menschen. III. Über das Vorkommen von Glukuronsäuren im menschlichen Blut. W. Stepp and E. Diebschlag (*Deutsch. Arch. f. klin. Mediz.*, 1921, **136,** 66-9).—An exact quantitative method does not exist; qualitative methods are discussed; they are only of value in certain conditions.—H. W.

3010. Fate of β-naphthylamine in the Organism of the Dog. Engel (*Zentr. Gewerbehyg. Unfallverhüt*, **8,** 816).—β-naphthylamine hydrochloride (1·0 and 0·5 g.) was administered to 2 dogs which were in a condition of N equilibrium and had a constant N and S elimination. Signs of illness were not observed. After the injection the amounts of $EtHSO_4$ and glycuronic acid in the urine were increased, and this lasted for 5 to 6 days. The ratio of the 2 acids indicated that much the greater part of the amine is eliminated in conjunction with the ethyl sulphuric acid, at any rate in the case of carnivorous animals. In 1 experiment with a carbohydrate diet only $\frac{1}{4}$ of the amine was associated with ethyl sulphuric acid, the remainder with glycuronic acid. The increment in the amounts of the 2 acids eliminated amounted in 1 experiment to 0·725 and 0·486 g. respectively. Assuming that only aminonaphthols are formed, this would correspond with 1·444 g. of β-naphthylamine, which is more than was actually administered; it appears, therefore, that dihydroxynaphthylamines are also formed. Unchanged β-naphthylamine could not be detected in the urine.—W. D. H. (*Chem. Abstr.*).

3011. The Metabolism of Nitrobenzaldehydes and Nitrophenylacetaldehyde. C. P. Sherwin and W. A. Hynes (*J. Biol. Chem.*, 1921, **47,** 297-301).—Nitrobenzaldhydes are oxidised to the corresponding acids in the human body, and partially excreted in the form of hippuric acids; *p*-nitrophenylacetaldehyde is oxidised to the corresponding acid without reduction of the nitro-group or conjugation with glycine.—H. E. R.

3012. Zur Frage über das Schicksal der Salizylsäure und einiger ihrer Derivate im Organismus. W. Devrient (*Arch. exp. Path. Pharm.*, 1921, **90,** 242-55).—Not more than 15% of salicylic acid administered is excreted in the urine. Sauerland's method of estimating it is found to be exact.—J. H. B.

3013. Transformation of Salicylic Acid in the Body. F. Angelico (*Arch. farm. sperim. sci. aff.*, 1921, **31,** 8-12).—If Na salicylate is given to dogs with food, gentisic acid appears in their urine. Baldoni's uraminsalicylic acid is probably impure gentisic acid.—W. D. H. (*J. C. Soc.*).

3014. La dégradation de l'acide valerianique normal dans l'organisme animal. L. Blum and E. Aubel (*Bull. soc. chim. biol.*, 1921, **3,** 307-10).—Normal sodium valerianate given intravenously in rabbits does not give rise to acetone bodies; this confirms

previous workers. The urine contains valeric acid, also *d*-lactic and pyruvic. How C_5 can be transformed into C_3 acids is discussed, and the analytical methods employed are described.—W. D. H.

TEMPERATURE

3015. The Surface Temperature of the Elephant, Rhinoceros, and Hippopotamus. F. G. Benedict, E. L. Fox, and Marion L. Baker (*Amer. J. Physiol.*, 1921, **56,** 464-74).—The surface temperature of the elephant was 25·5° C. in a surrounding temperature of 19·5° C. In the rhinoceros it was 26·2° C., although this animal was the more sluggish. That of the hippopotamus was more difficult to measure, but was about 25° C. Thus all 3 have about the same skin temperature. The interest of the observations lies in their comparison with man, as being free from fur or protective covering. A curious fact is the high temperatures found in both elephants tested at the tips of the left ears.—W. M. B.

3016. Ricerche di calorimetria. I. Il calorimetro differenziale. T. Gayda (*Arch. di fisiol.*, 1921, **19,** 1-32).—Detailed account of a slightly modified Hill's differential calorimeter, and of various experiments made in order to determine its loss of heat and thermic capacity.—C. d. F.

3017. Animal Calorimetry. XVII. Colloidal Iron and Basal Metabolism. E. Langfeldt (*J. Biol. Chem.*, 1921, **47,** 557-63).—Intravenous injection of Fe hydrosol in dogs increased O_2 consumption and CO_2 production. The average increase of heat production in one dog was 7, in another dog 15%. The respiratory quotient rose slightly. The chief increase of the total heat production falls on the non-protein metabolism.—W. D. H.

3018. The Effect of Cooling Power of the Atmosphere on Body Metabolism. J. A. Campbell, D. Hargood-Ash, and L. Hill (*J. Physiol.*, 1921, **55,** 259-64).—Basal metabolism of the body cells is raised by cool out-of-door conditions, even when shivering does not occur; metabolism is controlled by cooling power, not by temperature. Formulæ are given for rapid calculation of heat production of the resting subject, the information required being the dry katathermometer cooling power, the dry bulb air temperature, and the cheek temperature.—J. A. C.

SUGAR AND DIABETES

3019. La localisation du glycogène dans le foie et les muscles des chiens nourris en vue de la production maximale de cette réserve. Z. Gruzewska and Fauré-Frémiet (*Compt. rend.*, 1921, **173,** 254-7).—A fasting dog fed on a suitable diet somehow distends all the cells of the hepatic lobules to accumulate the glycogen. The liver enlarges enormously.—J. H. B.

3020. Die räumliche Trennung von Glykogen und Diastase in der Leberzelle. E. J. Lesser (*Biochem. Zeit.*, 1921, **119,** 108-20).—Perfusion of a frog's liver in the months August to January with hypertonic salt solutions leads to a 4-fold excretion of glucose over that produced by isotonic salt solutions. The glucose production rises to a maximum after 4 hours. In the spring and summer months there is no great difference between the effect of isotonic and hypertonic salines. This effect is independent of the ions of the salts used, and only slightly affected by the P_H. The action appears to be purely osmotic.—H. K.

3021. The Physico-Chemical State of Sugar in the Blood. K. Onohara (*Brit. J. Exp. Pathol.*, 1921, **2,** 194-6).—As shown by Kozawa, glucose causes swelling of human

red corpuscles. But practically the same hematocrite results were obtained with human red corpuscles treated with the serum of a diabetic patient, normal serum with the addition of isotonic glucose solution, or isotonic glucose-saline solution. It may therefore be assumed that sugar in the circulating blood is present in the same physico-chemical character as in the solution of free glucose. In other words, it must be present in the circulating blood in the form of free sugar.—*Author's Abstract.*

3022. Recherches comparatives sur la teneur en glucose du sang artériel et du sang veineux venant des muscles. R. Ege and V. Henriques (*Compt. rend. soc. biol.*, 1921, **85,** 610-11).—Experiments were carried out to determine the sugar content of venous and arterial blood. The hind-limb of the goat and dog was used, and the animals were prepared by fasting and the administration of phloridzin to remove all stores of carbohydrate. Under these conditions the arterial blood-sugar was 0·004, while the venous blood-sugar was $\frac{1}{5}$ of this—namely, 0·0008%.—J. H. B.

3023. Vergleichende Untersuchungen über die Glucosekonzentration in dem arteriellen Blut und in dem venösen Blut aus den Muskeln. V. Henriques and R. Ege (*Biochem. Zeit.*, 1921, **119,** 121-33).—No great difference of glucose content between arterial and venous blood is to be expected. The process is complicated by the existence of a carbohydrate reservoir in the muscles. Under special conditions a difference can be observed. In a condition of hyperglycæmia there is a large disappearance of glucose during passage through the muscles, and when the glucose concentration in the blood has again fallen the venous blood may contain more than the arterial.—H. K.

3024. The Reducing Substance in Human Blood. E. A. Cooper and H. Walker (*Biochem. J.*, 1921, **15,** 415-21).—The reducing substance is insoluble in ether, is destroyed by boiling with ammonia, and yields phenylglucosazone in typical crystals. After hydrolysis with HCl the reducing power of blood increases, the determination of which is complicated by (*a*) the destructive action of HCl on the reducer, and (*b*) a retarding effect on the reduction by the NaCl formed. MacLean's method (1919) was employed with modifications. Uric acid and creatinine were excluded under the experimental conditions employed.—J. A. H.

3025. I. Glycémie et hyperglycémie expérimentale chez les sujets normaux. II. Hyperglycémie expérimentale chez les glycosuriques et les diabétiques. M. Labbé, H. Labbé, and F. Nepveux (*Compt. rend. soc. biol.*, 1921, **85,** 397-400).—The curve of hyperglycæmia produced in a normal fasting subject at rest by the ingestion of 45 gm. of dextrose is sinusoidal in character. After reaching a maximum it swings back to less than the original value, and then again mounts to above the original level, etc. If a similar curve is obtained for a diabetic in whom glycosuria is temporarily overcome, it is seen to be similarly sinusoidal, but to have very different time relations, and the maximum reached above the original level is not (as in a normal case) about the same as the subsequent minimum is below it. A curve of this character will therefore indicate deranged carbohydrate metabolism in persons in whom evidence of such derangement is otherwise lacking.—J. H. B.

3026. Über den Zuckerstoffwechsel des Menschen—I. H. Staub (*Zeit. f. klin. Med.*, 1921, **91,** 44-60).—Even small amounts of glucose (10 to 20 g.) given *per os* distinctly increase the content of sugar in the blood of a healthy fasting adult. The blood-sugar curve after 20 g. dextrose is used as a standard method for the functional examination of sugar metabolism. The author concludes from the form of this curve under different conditions (duration of fasting, repeated feeding with glucose, etc.) that the power of the liver to fix glucose is variable.— H. W.

3027. Impermeability of the Blood-Corpuscles of Man and Rabbit for Glucose. S. van Creveld and R. Brinkman (*Versl. Kon. Ac. v. Wet.*, 1920, **29,** 893; *Biochem. Zeit.*, 1921, **119,** 65-72).—Brinkman and v. Dam showed that the blood-corpuscles of frog and man

are impermeable for glucose when all trace of clotting is prevented. For the human blood-corpucles this was not yet proved in a direct chemical way. The authors agree with Falta and Richter-Quittner that blood-sugar only occurs in the plasma, but they believe that hirudin blood should not be used, for hirudin is not able to prevent the first phases of clotting. This explains why some who also used hirudin blood did not get the same results. The authors now use 2 methods in which the blood is kept fluid without adding other substances. In the rabbit a piece of the jugular vein which was tied at both ends was centrifuged in a little tube. The plasma was obtained from the upper end. In man small quantities of blood were centrifuged in paraffined tubes. In both cases the total blood-sugar, the plasma-sugar, and the volume of the corpuscles were determined, the result being that the corpuscles contained no sugar.—R. B.

3028. The Glycolytic Power of the Blood. J. W. Koning (*Ned. T. v. Gen.*, 1921, **65,** 19).—Some modifications in Bang's method are proposed. The glycolysis is investigated after the method of Hekman and van Heeteren (*Ned. T. v. Gen.*, 1918, **62,** 497). It is stated that the amount of glucose decreases to a certain value, and then increases again. The author suggests that 2 processes are taking place, both of a fermentative nature. Putrefaction is not involved, and both ferments are bound to the corpuscles.— R. B.

3029. Über den Einfluss der Vagusdurchschneidung auf die Zuckerausscheidung in der Niere. F. Hildebrandt (*Arch. exp. Path. Pharm.* 1921, **90,** 142-8).—Cutting both vagi in rabbits enables the kidneys to excrete sugar more readily than before vagotomy was performed. The author determines this point by observing the height of the hyperglycæmia at which sugar appears in the urine, producing the hyperglycæmia by an injection of adrenaline.—J. H. B.

3030. Glycosuria during Pregnancy. R. S. Cron (*Amer. J. Obstet. and Gyn.*, 1920, **1,** 276-87).—In 30 to 50% of normal pregnancies there is a lowering of sugar tolerance, perhaps due to a lowering of the renal sugar threshold.—C. L. E.

3031. Sur la production du choc hémoclasique au cours de la glycosurie phoridzinique. D. Ionesco and M. Nasta (*Compt. rend. soc. biol.*, 1921, **85,** 540-2).—Widal and his co-workers have shown that when foreign protein gets into the blood-stream there is a "hæmoclastic shock" (leucocytes disappear, etc.). Similar phenomena are seen when sugar is given to diabetics, and this is explained by a breakdown of the body cells resulting in cell proteins getting into the blood-stream. In this communication the authors report a "hæmoclastic shock" on giving phloridzin to hospital patients. The shock symptoms only were seen when the phloridzin produced glycosuria, and were absent when no sugar appeared in the urine.—J. H. B.

3032. Welche Zuckerart wird vom Säugling im Harn ausgeschieden, wenn die für ihn festgestellte Assimilationsgrenze für Rohrzucker in der Nahrung überschritten wird. Eine Methode und ein Berechnungsmodus zur quantitativen Bestimmung mehrerer Zuckerarten nebeneinander im Harn. H. Murschhauser (*Biochem. Zeit.*, 1921, **119,** 328-38).—Experiments with babes under 1 year old showed that cane-sugar administered in excess of the assimilation value appeared in the urine partly unchanged, and partly as glucose and lævulose.— H. K.

3033. The Gastric Juice in Pancreatic Diabetes. M. E. Steinberg (*Amer. J. Physiol.*, 1921, **56,** 371-9).—The gastric juice (studied in Pavloff pouch) in dogs without a pancreas is less in amount after a meat meal than normal for the first 2 hours, but the secretion goes on longer (12 or more hours), and the total is more than double the usual quantity; its pepsin content is high, but the acidity is normal. This appears to be an effort to make up for the absence of pancreatic juice.— W. D. H.

3034. Action de l'extrait pancréatique injecté dans le sang. Paulesco (*Compt. rend. soc. biol.*, 1921, **85,** 555-9).—Pancreatic extract injected into a dog with extirpated pancreas diminishes the hyperglycæmia and glycosuria, and also the acetone bodies in

blood and urine. The effect is at its maximum in 2 hours, and lasts as long as 12 hours. The more extract given, the greater the effect. The extract given to a normal dog diminishes the blood-sugar.—J. H. B.

3035. Antiketogenesis. I. An in vitro Analogy. II. The Ketogenic Antiketogenic Balance in Man. P. A. Schaffer (*J. Biol. Chem.*, 1921, **47**, 433-48, 449-73).—I. Glucose, fructose, and glycerol increase the rate of oxidation of aceto-acetic acid by hydrogen peroxide in alkaline solution. II. A comparison is made between the amount of "acetone bodies" formed from fat and protein, on the one hand, with the glucose producing portions of protein, carbohydrate, and fat on the other. The comparison suggests a definite molecular relationship between the "ketogenic" and "antiketogenic" substances.—H. E. R.

3036. Blood-Pressure in Diabetes. J. Rosenbloom (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 236-7).—The blood-pressure in uncomplicated diabetes mellitus is normal or slightly under normal (140 cases). In every case of raised blood-pressure in this series there were complications, such as aortitis, arterio-sclerosis, nephritis, or cardiac changes. In acidosis the blood-pressure falls. The presence or absence of hyperglycæmia has no effect on the blood-pressure.—D. H. de S.

3037. Über die Vorgänge bei der Zuckerausscheidung im Diabetes. O. Schmiedeberg (*Arch. exp. Path. Pharm.*, 1921, **90**, 1-26).—An interesting account of this author's views on the essential cause of diabetes. He considers that glucose combines in the diabetic organism with a product of protein breakdown, and that this complex cannot be oxidised. The kidney breaks up this combination, and sets free the glucose in the urine. The pancreas normally has the duty of preventing the formation of this incombustible glucose complex, a function which can be inhibited by adrenaline. He points out that the liver can form glycogen from lævulose in the diabetic, and that there cannot therefore be any loss on the part of the liver of its glycogenetic power. Similarly he is emphatic that hyperglycæmia by itself never leads to glycosuria. The suggestion of the "glucose-protein derivative" combination comes from the early work of Straub and Rosenstein, who showed that CO poisoning in fasting dogs never produces a glycosuria unless they are fed with certain forms of protein or products of protein digestion. Such animals do not become glycosuric from the administration of dextrose.—J. H. B.

3038. Zur Wirkung der Röntgenbestrahlung der Nebennieren auf den Stoffwechsel bei Diabetes. H. Beumer (*Zeit. f. Kinderheilk.*, 1921, **28**, 329-34).—In a case of a young diabetic (6 years) a diminutiou of the blood-sugar to nearly normal values and disappearance of acidosis resulted from irradiation of the suprarenal gland with Röntgen rays. The tolerance for carbohydrates and the excretion of sugar in the urine showed no amelioration.—H. W.

3039. Objects and Method of Diet Adjustment in Diabetes. R. T. Woodyatt (*Arch. Int. Med.*, 1921, **28**, 125-41).—An interesting account of the successful treatment of an emaciated diabetic, illustrating the danger of dealing with such cases by continued starvation until glycosuria disappears. It is argued that a starved, emaciated subject breaks down body protein to supply essential energy, and in so doing pours out glucose into the blood. If fat is given, this breakdown of body protein can be arrested. When the quantity of glucose from protein is thus cut down, there is an opportunity to introduce carbohydrate into the diet for "antiketogenetic" purposes, and to suppress the breakdown of tissue protein still further. The essential point is the value of fat administration.—J. H. B.

KIDNEY AND URINE

3040. The Function of the Urinary Tubules in the Frog. Mildred Atkinson, G. A. Clark, and J. A. Menzies (*J. Physiol.*, 1921, **55,** 253-8).—Simultaneous perfusion of the renal arteries and the renal portal veins was employed, the pressure (24 to 26 cm. H_2O in the cannula) in the former being twice that in the latter; the flow from the arteries was about $\frac{1}{3}$ that from the veins; oxygenated Ringer's fluid, often with the addition of 2% gum, was used; the gum prevented œdema. Urea, sulphate, and glucose are filtered through the glomerular membranes; the cells of the tubules are capable of transmitting urea and sodium sulphate, but not glucose, from perfusing fluid to urine.—J. A. C.

3041. Über den Einfluss der Nervendurchschneidung auf die Wasser- und Salzausscheidung durch die Niere. P. Ellinger (*Arch. exp. Path. Pharm.*, 1921, **90,** 77-104).—An account of work done by the author and the late E. Rohde. Experiments on nerve section show that the nerves accompanying the renal artery exert an inhibitory influence on the excretion of water and the solid constituents of urine. The greater splanchnic nerve has a similar but small inhibitory influence, from which chlorides are exempt. The greater splanchnic and vagus taken together have a different influence from that of the nerves entering the hilus; there is therefore an additional factor in the abdominal sympathetic. The vagus and splanchnic affect water excretion in the same sense, but that of solid constituents in opposite senses.—J. H. B.

3042. Der Nachweis kleinster Milchzuckermengen im Harn durch Bildung von Formaldehyd. K. Herzberg (*Biochem. Zeit.*, 1921, **119,** 81-92).—The injection of lactose for testing renal capacity necessitates a ready method for its recognition in the urine. Concentrations of 0·2% can be recognised by isolating the osazone and oxidising it to formaldehyde, and detecting the latter by a colour test.—H. K.

3043. Versuche mit kolloiden Metallen zum Studium der Funktionsweise der Nieren. J. Voigt and M. Fritz (*Biochem. Zeit.*, 1921, **120,** 303-18).—Colloidal solutions of silver iodide, chloride, copper, bismuth, manganese, iron, gold, and silver were injected intravenously into rabbits. Sections of the kidneys are described and figured. The results do not lend themselves to summary.—H. K.

3044. The Synthesis and Elimination of Hippuric Acid in Nephritis: A New Renal Function Test. F. B. Kingsbury and W. W. Swanson (*Arch. Int. Med.*, 1921, **28,** 220-36).—A test of renal function is described based on the rate at which hippuric acid is excreted by the kidney after a dose of 2·4 gm. sodium benzoate by the mouth. The excretion is much slower in nephritics.—J. H. B.

3045. Renal Irritation in Man from High Protein Diet. T. L. Squier and L. H. Newburgh (*Arch. Int. Med.*, 1921, **28,** 1-19).—Patients with symptoms of arterial hypertension and normal subjects were fed with excessive protein (100 to 180 gms. per day). All showed red cells in the urine, some after 2 or 3 days, some after 2 or 3 weeks. —J. H. B.

3046. The Removal of Bile and Blood from the Urine. C. S. Burwell and C. M. Jones (*J. Amer. Med. Assoc.*, 1921, **77,** 462-3).—In carrying out the phenolsulphonephthalein test of renal function the urine sample collected during 2 hours 10 minutes after injection of the dye is diluted to 500 c.c. with tap water; to 20 c.c. of this 20 c.c. of saturated alcoholic Zn acetate are added and the mixture filtered; 20 c.c. of filtrate is made alkaline with 5 c.c. of saturated NaOH, made to 40 c.c. with tap water, and its colour compared with that of the standard sulphonephthalein solution.—C. L. E.

3047. The Effect of Hydrochloric Acid Ingestion upon the Composition of the Urine in Man. R. L. Stehle and A. C. McCarty (*J. Biol. Chem.*, 1921, **47,** 315-9).—Ingestion of HCl causes an increased excretion of K, Na, NH_3, P_2O_5, and H-ions.—H. E. R.

3048. The Sources of Urobilin. M. Brulé (*J. pharm. chim.*, 1920, **22,** 401-11).—Urobilinuria (*A*) is of neither renal nor entero-hepatic origin; urobilin (stercobilin) may occur in the animal intestine even after tying of the bile-duct. *A* is nearly always accompanied by an abnormally high amount of bilirubin (*B*) in the blood, indicating *biliary retention* in the tissues. Three possible causes are given: (*a*) Icterus of hæmolytic origin; excessive amounts of *B* are formed in the blood at the expense of hæmoglobin. When *B* reaches a certain limit (*seuil d'excrétion*), its more diffusive and less toxic reduction product, urobilin, will pass into the urine. As the hepatic function is normal, there is no retention of biliary salts in this case. (*b*) Obstruction of the bile-ducts. (*c*) The most frequent cause of *A* is lesion of the hepatic cell, which renders the liver more or less incapable of excreting bile-pigments and salts. Thus, testing for *A* becomes a valuable means of qualitative, although not quantitative, diagnosis of the early stages of lesions of the liver. The author doubts the existence of physiological *A* except perhaps in traces; but transitory *A* has been observed in certain individuals after excess of drink or food or fatigue.—W. D. H. (*Chem. Abstr.*).

3049. Zur Visco- und Stalagmometrie des Harns. E. Joël (*Biochem. Zeit.*, 1921, **119,** 93-107).—The viscosity of normal urine is 1·0 to 1·05. The presence of colloidal materials has considerable influence.—H. K.

3050. Variations physiologiques de la tension superficielle des urines. E. Duhot and C. Gernez (*Compt. rend. soc. biol.*, 1921, **85,** 506-7).—Stagalmometry is a useful method for studying the elimination of bile salts, etc., in the urine.—J. H. B.

3051. Some Urinary Changes in Normal Individuals on the Pellagra producing Experimental Diet. M. X. Sullivan (*Arch. Int. Med.*, 1921, **28,** 119-23).—There was found a diminished average volume, a marked decrease of total N and urea N, and a slight decrease in ammonia N.—J. H. B.

3052. Phenols in the Urine in Pellagra. M. X. Sullivan and P. R. Dawson (*Arch. Int. Med.*, 1921, **28,** 166-72).—The excretion is normal.—J. H. B.

3053. Über Alkaptonchromogene. G. Katsch and G. Nemet (*Biochem. Zeit.*, 1921, **120,** 212-7).—The ethereal extract of an alkapton urine poured on to unburnt lime acquires an evanescent vivid blue colour. The reaction is very sensitive. The urine of many individuals, after administration of homogentisic acid, slowly darkens, but homogentisic acid is not detectable. The supposed derivatives of the acid which give rise to this reaction are called alkapton chromogens.—H. K.

3054. Detection of Albumin in Urine. W. Rado (*Gyogyaszat*, **6,** 66-7).—The test is applied by the addition of H_2SO_4 (5%; about 1 c.c.) and Na nitroprusside solution (8 to 10 drops) to the filtered urine (5 to 10 c.c.); in sensitiveness and clinical applicability the test is equal to Boedeker's method with $K_4Fe(CN)_6$ and AcOH.—W. D. H. (*Chem. Abstr.*).

3055. Hæmolytic Substances in Normal Urine. E. Ponder (*Brit. J. Exp. Pathol.*, 1921, **2,** 192-3).—64% of normal unselected urines were hæmolytic. If the non-hæmolytic specimens had been examined repeatedly they would probably have been found to be hæmolytic at some time. It seems that the presence of hæmolytic action is more frequent in insanity, but in itself is not abnormal.—*Author's Abstract.*

ENDOCRINE SYSTEM

3056. Endocrine Organs and Human Evolution. L. Bolk (*Lancet*, 1921, ii., 588-92).—A lecture recently given at London University. The subject is treated on general lines, and does not lend itself to abstraction; but the keynote is the part played by these organs in evolution, from the anthropological standpoint.—W. D. H.

3057. Thyroid Studies. II. Intestine-Contracting Substance. F. S. Hammett and K. Tokuda. **IV. Action of Thyroxin on Intestinal Segment.** F. S. Hammett (*Amer. J. Physiol.*, 1921, **56,** 380, 386-9).—II. Extracts of rats' thyroid contain a variable amount of a substance which promotes contractility in an isolated intestinal loop. The cause of variation is attributed to age; at certain periods of life the amount of the substance increases—namely, at birth, at weaning, at puberty, and at completion of growth. IV. Pure thyroxin does not produce the intestinal effects.—W. D. H.

3058. Über den Einfluss von Schilddrüsensubstanz auf die Wasser und Chlorausschiedung im Harn beim Säugling. E. Schiff and A. Peiper (*Jahrb. f. Kinderheilk.*, 1921, **94/44,** 285-94).—The excretion of water, and to a greater extent that of NaCl, is accelerated by thyroiodin.—H. W.

3059. Interrelation of Function of the Thyroid Gland and of its Active Agent, Thyroxin, in the Tissues of the Body. H. S. Plummer (*J. Amer. Med. Assoc.*, 1921, **77,** 243-7).—Thyroxin is present in the tissues of the body generally, and its amount (excluding that in the thyroid) is about 14 mg. Of this, 0·5 to 1·0 mg. are exhausted per day, a shift of 1 mg. causing an alteration of basal metabolism of 2 to 3%. After the administration of a single dose of 14 mg. thyroxin to a thyroidless patient, the basal metabolism becomes normal, and in 10 to 12 days the physiological state of the patient is normal, and remains normal for about 10 days; the dose is not fully exhausted for 5 to 8 weeks. A daily dose of 2 mg. thyroxin may hold the basal metabolism 20 to 30% above normal, and 3 mg. per day may hold it 50% above normal. Elevation of basal metabolism follows every intravenous dose of more than 1 mg., except in exophthalmic goitre and large colloid goitre. Doses of 1 mg. or less daily have no effect on basal metabolism, but probably cause a state of thyroid rest. It would seem that the stimulus to the production of thyroxin by the thyroid is a drop in the thyroxin content of the tissues. Clinical aspects of the thyroid are also discussed from the physiological standpoint. A hyperfunctioning adenomatous goitre is the result of pure hyperthyroidism, but in exophthalmic goitre there are other factors (see also Abstract No. 1437, Vol. VI., p. 211).—C. L. E.

3060. The Basal Metabolic Rate in Hyperthyroidism. W. M. Boothby (*J. Amer. Med. Assoc.*, 1921, **77,** 252-5).—The value of basal metabolism measurements as an aid to the differential diagnosis of functional neurasthenia from mild exophthalmic goitre or adenoma with hyperthyroidism is illustrated by examples.—C. L. E.

3061. I. Divers aspects de la cellule hépatique chez les têtards de Rana temporaria nourris avec de la thyroïde. II. Etude histologique des phénomènes provoques chez le têtard de Rana temporaria par l'alimentation thyroïdienne. J. Dragoiu and E. Fauré-Fremiet (*Compt. rend. soc. biol.*, 1921, **85,** 434-9).—Histological changes in the liver and other organs of tadpoles fed on thyroid gland are described.—J. H. B.

3062. The Parathyroids: A Review. W. M. Boothby (*Endocrin.*, 1921, **5,** 403-40).—The title indicates the nature of the communication. In the summary the author says that the experimental evidence pointing to the parathyroids as the primary cause of idiopathic tetany unassociated with operative procedures on the thyroid is very limited.—S. V.

3063. Adolescent Tetany and its Relation to Guanidine. F. J. Nattrass and J. S. Sharpe (*Brit. Med. J.*, 1921, ii., 238-9).—A girl of 15 suffered from attacks of tetany. She was placed upon a creatine-free diet for 1 week. During that time the daily excretion of guanidine averaged 305 mg. in the urine and 17 mg. in the fæces, making a daily total of 6·7 mg. per kilo of body-weight. In 5 cases free from tetany previously reported by Burns and Sharpe, and in which the estimations were carried out by a method which gave lower results, the daily average in the urine was 0·116 mg. per kilo of body-weight.—D. H. de S.

3064. Beiträge zur pharmakologischen Wirkung des Guanidins. R. Klinger (*Arch. exp. Path. Pharm.*, 1921, **90,** 129-41).—Experiments on the effect of guanidine and its methyl derivatives on cats and rats. The author confirms the similarity of the symptoms to those of tetany following parathyroidectomy, but says that they are not in any way relieved by the administration of calcium salts, as are those of tetany.—J. H. B.

3065. Beitrag zur Epithelkörperchenfrage, unter besonderer Berücksichtigung der Acidophilie der Zelle. H. Koopmann (*Frankfurter Zeit. f. Path.*, 1921, **25,** 342-72).—The theory of Lundborg concerning the parathyroid origin of paralysis agitans has no foundation. The acidophily of the parathyroid cells may be a morphological proof of the relationship of the parathyroids to the hypophysis and the pancreas. The acidophily of these cells increases in a constant manner up to the 70th to 80th year of life.—H. W.

3066. Influence of Endocrine Glands on Respiration. II. Adrenal Insufficiency in Rabbits. D. Marine and E. J. Baumann (*Amer. J. Physiol.*, 1921, **57,** 135-52).—Removal or crippling (freezing) of the adrenal produces metabolic disturbances, usually characterised by increase of heat production and CO_2 output. In this the cortex is mainly responsible. The symptom-complex is not unlike that of exophthalmic goitre.—W. D. H.

3067. Does the Administration of the Anterior Lobe of the Hypophysis to the Tadpole produce an Effect Similar to that obtained from Thyroid Feeding? P. E. Smith and G. Cheney (*Endocrin.*, 1921, **5,** 448-60).—Evidence has been advanced by Hoskins showing that the administration of a commercial anterior lobe preparation to the normal and thyroidless tadpole gives an effect similar to that characteristic for thyroid administration—*i.e.*, is a decisive stimulus to metamorphosis. The work of Hoskins was confirmed with the commercial preparation used. Three other dried gland preparations and the fresh gland failed to give any decisive stimulus. The preparation used by Hoskins contained an unusual amount of iodine, and displayed an altogether unique activity.—W. D. H. (*W. I.*).

3068. The Relation of the Pars Intermedia of the Hypophysis to Pigmentation in Anuran Larvæ. W. W. Swingle (*J. Exp. Zool.*, 1921, **34,** No. 2).—Homoplastic and heteroplastic transplants of the pars intermedia from adult frogs of various species were made into bullfrog tadpoles. The effect upon growth and metamorphosis was negative, but pigmentation changes were marked. Within 24 hours the larvæ became deeply pigmented, changing from a light yellow to almost black. This is due to expansion of the melanophores. This lasts as long as the engrafted tissue remains functional. Following absorption of the graft the animals resume normal colouration. Environment plays no part in the change; it is due to the effect of the hormone either directly upon the melanophores or else indirectly through the nervous system.—W. D. H. (*W. I.*).

3069. Die Hypophyse bei Hypothyreose, nebst Bemerkungen über die Schwangerschaftshypophyse. W. Berblinger (*Mit. a. d. Grenzgebiet. d. Chir. und Med.*, 1921, **33,** 92-112).—In hypothyroidism a change in the pituitary occurs like that which takes place during pregnancy. Similar changes (increase and hypertrophy of the chief cells) were observed after injections of placental extract, peptones, and fœtal "press juice" in rabbits. These changes are more intense in female rabbits. Rabbits deprived of the thyroid or castrated show the same picture.—H. W.

3070. The Administration of Pituitrin at the Beginning of the Third Stage of Labour. G. H. Ryder (*Amer. J. Obstet. and Gyn.*, 1921, **2,** 61-6).—A study of 100 cases leads the author to conclude that the use of pituitrin is advantageous in the 3rd stage.—C. L. E.

3071. Pankreas und Hypophyse. E. J. Kraus (*Beitr. z. path. Anat. u. allg. Path.*, 1921, **68,** 258-77).—Cats were depancreatised, and the subsequent changes in various endocrine organs were studied. The pituitary lost in weight and its eosinophile cells

degenerated. The thyroid at first gave some evidence of increased activity, and afterwards of atrophy. The lipoid material vanished from the suprarenal, and there was no evidence of increased suprarenal activity. Atrophy of the interstitial and spermatogenous tissue of the testes, of the interstitial cells of the ovary, and of the epiphyses was also seen.—H. W.

3072. Internal Secretion of the Spleen. N. B. Eddy (*Endocrin.*, 1921, **5,** 461-75).—It is claimed that the spleen produces an internal secretion which regulates the number of red corpuscles in the blood-stream. This is supported by the changes in the erythrocytes after splenectomy; the modification of the blood-picture in hyperplasia of the spleen, ameliorated in some cases by splenectomy; and the specific effects on the red corpuscles of injection of splenic extract. It is suggested that the chief function of the spleen is the removal from the circulation of the disintegrated erythrocytes; that the splenic cells elaborate this material, producing thereby an internal secretion, which was a component of the erythrocyte, either stroma or pigment portion; that this internal secretion reduces the resistance of all the red blood-corpuscles, the effect amounting to actual destruction of the older cells; and, finally, that this internal secretion, possibly after modification by the liver, stimulates the erythrogenic function of the bone-marrow, and is used up in the manufacture of new corpuscles.—W. D. H. (*W. I.*).

3073. Function of the Tonsils. Fleischmann (*Arch. Laryngol. u. Rhinol.* 1921, **34,** No. 1).—The author is inclined to place these among the endocrine organs on the ground that in health (5 specimens) he obtained certain reducing substances from them, that these materials pass either into the saliva or into the blood-stream, and that in certain diseased conditions they may be absent.—W. D. H. (*Arch. méd. belges*).

3074. Über einige neuere, angeblich spezifische Organextraktgifte. H. Dold (*Zeit. f. Immunitätsforsch. u. exp. Ther.*, I. Orig., Jena, 1920, **29,** 276-86).—Dold calls attention to the study of the toxicity of watery and saline extracts of normal and diseased organs which he published in 1911, and criticises the work of later writers who have attributed specific properties to the toxic extracts of certain organs in certain conditions. He shows that Olkon's work on the disturbances of growth and enfeebled condition of animals repeatedly injected with extracts of the thymus does not indicate that the thymus alone contains substances which disturb nutrition, as it has been shown that the extract of any organ will have a similar effect. The greater toxicity of organs from animals with infections can be resolved into 2 factors which account for this property without making it necessary to suppose that in these conditions the organs elaborate a specific toxin. One is the primary toxicity of the organ extract, and the other is the toxicity of the bacterial substances in the tissues. Exsanguination of an organ also influences the toxicity of its extract. Blood interferes with the reaction, and unless removed reduces the toxicity of the extract.—W. D. H. (*Abstr. Bacteriol.*).

3075. Epilepsy Suggestive of Endocrine Relationship. H. J. Van d. Berg (*Endocrin.*, 1921, **5,** 441-7).—The author reports 11 cases in which he sees hints that endocrine disturbance may be an important factor in some cases of epilepsy.—S. V.

REPRODUCTIVE SYSTEM

3076. The Survival of Motility in Mammalian Spermatozoa. C. G. L. Wolf (*J. Physiol.*, 1921, **55,** 246-8).—The motility of rabbit spermatozoa can be preserved for at least 9 days in a buffered Tyrode solution containing glucose and adjusted to a P_H of about 7·4; O_2 and $NaHCO_3$ are also added, whilst the temperature must be near the freezing-point of water. Experiments made to fecundate rabbits with spermatozoa which had been kept in salt and glucose solutions were unsuccessful.—J. A. C.

3077. L'expérience de Regnier de Graaf, et les fonctions des vésicules séminales. E. Wertheimer and C. Dubois (*Compt. rend. soc. biol.*, 1921, **85,** 504-5).—If methylene blue is injected into the vas deferens, then the colour passes directly into the urethra without entering the vesiculæ seminales, providing that the orifices of the ejaculatory ducts are not compressed. This result has been obtained 4 times in a bull and twice in a ram. No spermatozoa were found in the vesiculæ in these cases.—J. H. B.

3078. Keimdrüse und Geschlechtsentwicklung. J. Halban (*Arch. f. Gynäkol.*, 1921, **114,** 289-303).—The author concludes that Steinach's experiments prove with a certain plausibility a specific sexual effect of the hormones of the sexual glands, but that various factors can be only explained on the supposition of a primary germ for all sex characters in the direction of the one or the other sex.—H. W.

3079. Über die Rattenräude und ihre Beziehung zu den Steinach'schen Verjüngungsversuchen. J. Fiebiger (*Wien. klin. Woch.*, 1921, **34,** 364-6).—The experiments of Steinach must be repeated with healthy animals; those he used had mange, and his results may have been due to this circumstance.—H. W.

3080. Disparition spontanée de certains caractères sexuels secondaires chez un Coq. Etude histologique du testicule. P. Portier and R. de Rorthays (*Compt. rend. soc. biol.*, 1921, **85,** 444-6).—The testicles of a fully-developed cock underwent atrophy after a year. Erectile organs ceased to function, and sexual manifestations disappeared. Other secondary characteristics remained. Spermatogenesis was found to have ceased, and the cells of Sertoli could no longer proliferate.—J. H. B.

3081. Sur le conditionnement des caractères sexuels secondaires chez les batraciens urodèles. M. Aron (*Compt. rend. soc. biol.*, 1921, **85,** 482-4).—The author has determined that for *Molge cristata* the secondary sexual characteristics depend for their development on the internal secretion of the glandular tissue which presides over the nutrition of the sperms.—J. H. B.

3082. Sur le conditionnement des caractères sexuels secondaires chez les poissons. R. Courrier (*Compt. rend. soc. biol.*, 1921, **85,** 486-8).—The results of a similar investigation to that recorded in the last abstract. The subject was *Gasterosteus aculeatus*.—J. H. B.

3083. Über die Wirkung des Placentar- und Hodenlipoids auf die männlichen und weiblichen Sexualorgane. O. O. Fellner (*Pflüger's Arch.*, 1921, **189,** 199-214).—Lipoids prepared from placenta, ovary, or corpus luteum, when injected subcutaneously or intraperitoneally, produce enlargement of the mammary glands, uterus, etc., in the female; in the male a degeneration of the testis and epididymis results, so that these return to the immature condition present at birth. Injection of testicular lipoid produces similar effects on the female to those seen with placenta or ovary extracts, while on the male the effect is to produce degeneration of the generative portions of the testis, with increase of interstitial cells. There follow some speculations regarding the functions of the " female sexual lipoid " in the testis.—C. L. E.

3084. Cyclic Changes in Ovaries and Uterus of Sow. G. W. Corner (Carnegie Inst., Washington, Contrib. to Embryol. 64, *Publication* **276,** 1921, 117-46).—In the ovary the follicle ruptures during œstrus, the corpora lutea attain completion about the 7th day, and remain so till the 14th to 15th day. This interval covers the period during which embryos are becoming attached, but if no pregnancy occurs the corpora lutea begin to atrophy on the 15th day. In the uterus the parallel changes are: During œstrus there is a characteristic state of the mucosa (described in full, with figures); while the corpora lutea are forming the epithelium, glands, and stroma develop and become mature about the same time as the corpora lutea become solid; from day 8 to 10 the epithelium has the appearance of active " serous " secretion, then the cells lose height and their edges are rough; from day 15 there is slow regression to the œstrous type; this is analogous

to what occurs in the first 2 weeks of pregnancy, and no doubt permits attachment of embryos. The preliminary serous secretion aids flotation and migration; the roughening of the cells assists attachment. Such views fit in with known facts in other animals.—W. D. H.

3085. Action exercée par le corps jaune sur la maturation des follicules et sur la chaleur de la lapine. F. Nielsen (*Compt. rend. soc. biol.*, 1921, **85,** 614-5).—The maturation of the Graafian follicles is only one of the factors leading to the onset of heat.—J. H. B.

3086. Some Chemical Studies in Normal and Abnormal Pregnancies—I. J. A. Killian and C. P. Sherwin (*Amer. J. Obstet. and Gyn.*, 1921, **2,** 6-16).—Studies on the blood. In normal pregnancies the non-protein and urea N of the blood are low, and the urea N is about 44% of the non-protein N. Apart from a slight reduction in the bicarbonate content of the plasma in the later months, no other marked chemical changes were noticed. In the nephritic toxæmias the high urea (50% of total non-protein) N and non-protein N were characteristic of the nephritic condition. In pernicious vomiting and eclampsia, while non-protein N is high, the urea only forms 15 to 38% of it, and there is also increase in uric acid, with moderate "acidosis," due to secondary involvement of the kidney.—C. L. E.

3087. The Blood Chemistry in Normal and Abnormal Pregnancy. W. E. Caldwell and W. G. Lyle (*Amer. J. Obstet. and Gyn.*, 1921, **2,** 17-34).—Except in a few details, the findings are similar to those dealt with in the preceding abstract.—C. L. E.

3088. Nausea and Vomiting in Pregnancy. V. J. Harding (*Lancet*, 1921, ii., 327-31).—Intestinal intoxication and neurosis are secondary factors; the main cause is lack of glycogen in the maternal liver, and the main treatment should be administration of glucose. (I know it is the habit of many anæsthetists to give plenty of sugar before an operation to combat post-anæsthetic vomiting. Perhaps the same explanation holds here.)—W. D. H.

3089. Experimental Studies following Oophorectomy. H. Bailey (*Amer. J. Obstet. and Gyn.*, 1921, **2,** 77-83).—A review.—C. L. E.

3090. Über das Wesen der sogenannten Abderhalden'schen Reaktion. E. Abderhalden (*Fermentforsch.*, 1921, **4,** 328-58).—Critical discussion of the subject.—H. W.

3091. The Determination of Sex. R. Goldschmidt (*Nature*, 1921, **107,** 780-4).—An interesting summary of the subject, in which the subject is regarded from the Mendelian and cytological points of view. The genetic facts of sex-linked inheritance can be completely explained by assuming that Mendelian factors inherited in that peculiar way are carried within the X-chromosomes, the Mendelian explanation being only a symbolical way of representing what actually happens when the X-chromosome mechanism is set to work. Examples are given.—C. L. E.

3092. A Study of the Hæmoglobin after Childbirth, with Special Reference to the Resumption of Menstruation. M. P. Rucker (*Amer. J. Obstet. and Gyn.*, 1921, **1,** 964-72).—The Hb content of the blood falls immediately after delivery, and the average case resumes menstruation when the content reaches about 75%.—C. L. E.

3093. Experimentelle Untersuchungen mit Rattenparabiosen. I. Gegenseitiger Einfluss beider Tiere im parabiotischen Zustand. R. Matsuyama (*Frankfurter Zeit. f. Path.*, 1921, **25,** 97-111).—Cœlostomy is the best method to obtain parabiosis (artificial Siamese twins). The best animals are young white rats, 1 to 3 months old, of the same age and weight. The cause of the death is often the narcosis, infection of the wound, or inhibition of growth. After the death of the one animal the other one dies immediately. The difference of growth in the 2 animals depends on their degree of vitality. The weaker becomes more and more decrepit, and dies of hunger. The communication of the capillary bloodvessels is effected about 2 to 4 weeks after the operation.—H. W.

3094. Experimentelle Untersuchungen mit Rattenparabiosen. II. Die Folgen der Nierenexstirpation. R. Matsuyama (*Frankfurter Zeit. f. Path.*, 1921, **25,** 216-35).—If both kidneys of the one animal in the parabiosis are extirpated, the duration of its life is considerably longer than that of the control animal. The second animal shows the same clinical and pathological symptoms as its partner without kidneys, but in less degree. No proof of any internal secretion of the kidneys could be found.—H. W.

3095. Untersuchungen mit Rattenparabiosen. III. Die Veränderungen der Geschlechtsdrüsen und der Organe, die damit in inniger Beziehung stehen. R. Matsuyama (*Frankfurter Zeit. f. Path.*, 1921, **25,** 436-85).—Histological investigations on the formation and development of the interstitial tissue and the changes during pregnancy and after castration are first described. On the basis of these normal pictures, the results of the experiments with parabiosis animals were the following: The primary change in the parabiosis of a male and female animal lies in both sexual glands. In the first phase corpora lutea are developed in the ovary, and the testes show an abnormal development. In the second phase numerous cysts and the interstitial tissue take the place of the corpora lutea, and the testes degenerate. Changes of other organs are secondary, and like those seen after degeneration of the sexual glands. If of 2 female animals in parabiosis the one is pregnant, the organs of the other also show some of the characteristic changes of pregnancy, but not in such a high degree as in a normal pregnant animal. Attempts to impregnate a female living in parabiosis with a male were nearly always negative (degeneration of the ovary). The changes in the organs of an animal living in parabiosis with a castrated animal are described. If the corpus luteum is lost the uterus degenerates, although the interstitial tissue is often well developed. The hypertrophy and hyperplasia of the mammæ during pregnancy are caused by a hormone from the corpus luteum. The changes in the hypophysis during pregnancy and after castration are dependent upon the degeneration of the follicle, caused by the development of the corpus luteum. The same is true of the changes in the cortex of the suprarenal.—H. W.

PHARMACOLOGY AND TOXICOLOGY

3096. Anæsthesia with Nitrous Oxide and Oxygen under Pressure. H. H. Dale and L. Hill (*Lancet*, 1921, ii., 326-7).—Though this is the safest anæsthetic, it has the disadvantage of producing asphyxia, and so, as a rule, is only used for short operations. The disadvantage is overcome by giving oxygen as well, and prolonged experiments on dogs and cats were successfully undertaken when the gas was given in a chamber in which the oxygen-pressure was an extra half atmosphere. To build such chambers with a suitable air-lock for man is a simple engineering problem.—W. D. H.

3097. New Anæsthetic. R. L. M. Wallis and C. L. Hewer (*Proc. Roy. Soc. Med.*, 1921, **14,** Sect. of Anæsth., 37-47).—See Abstract No. 2270, Vol. VI., p. 329).—W. D. H.

3098. Ethyl Chloride in General Anæsthesia. A. E. Guedel (*J. Amer. Med. Assoc.*, 1921, **77,** 427-9).—The author places the substance below N_2O—O_2 and ether, but above chloroform in value; it is especially valuable for induction. The symptoms of anæsthesia by its use are described.—C. L. E.

3099. Current Progress in the Science and Practice of Anæsthesia. J. T. Gwathmey (*J. Amer. Med. Assoc.*, 1921, **77,** 421-3).—An address dealing with sequences and combinations, the synergic effects of $MgSO_4$, preliminary medication (morphine-atropine, $MgSO_4$ and morphine, etc.), shock, methods for brain and lung surgery, oil-ether colonic anæsthesia, local, regional, and spinal anæsthesia.—C. L. E.

3100. The Effect of Cyanides and of Organic Oxidising Agents on the Liver Injury caused by Chloroform. N. C. Davis (*Arch. Int. Med.*, 1921, **28,** 20-36).—Small subcu-

taneous doses of chloroform in dogs cause extensive liver necrosis in fasting animals. The administration of iodoxy benzoic acid, etc., has no effect on this necrosis neither has the administration of cyanides.—J. H. B.

3101. Experimentelle Beiträge zur Theorie der Narkose. J. Traube and P. Klein (*Biochem. Zeit.*, 1921, **120,** 111-24).—The authors have examined the Tyndall effect and the ultramicroscopic behaviour of aqueous solutions of a number of organic substances of slight or moderate solubility, and find evidence of colloidal solution. Some substances show 2 widely-differing degrees of dispersity, and stalagmometric experiments on these show that the higher the dispersity the greater the effect on the surface tension of water. The results show that other factors besides those postulated in Traube's theory of narcosis must play a part, inasmuch as hydrocarbons and alkyl halides which have little effect on the surface tension of water are powerful narcotics. —H. K.

3102. Die Wirkungsstärke der Narkotica. I. Versuche am isolierten Froschherzen. H. Fühner (*Biochem. Zeit.*, 1921, **120,** 143-63).—The isonarcotic concentration of 40 substances has been determined on the isolated frog's heart. The drop numbers were also compared by means of Traube's stalagmometer. Alcohols and their derivatives, paraldehyde, acetone, and ether have a marked effect on the surface tension. Esters are less active, but benzene and many alkyl halides are inactive even in saturated solution. Apart from the alcohols and related derivatives, there is no correspondence between narcotic action and depression of surface activity as postulated by Traube's theory. The narcotic concentrations do, however, show a parallelism with the aqueous solubility or the solubility in salt solutions.—H. K.

3103. Die Wirkung einiger Verwandten des Chloroforms mit besonderer Berücksichtigung der Traubeschen Theorie über die Wirkung der Narkotica der Fettreihe. G. Joachimoglu (*Biochem. Zeit.*, 1921, **120,** 203-11).—Traube's theory of narcosis is untenable. Among the chloro-derivatives of methane and ethane or ethylene, the narcotic action and surface activity are by no means parallel.—H. K.

3104. Über die Wirkung einiger Arzneimittel auf die Schmerzempfindung. W. Möhrke (*Arch. exp. Path. Pharm.*, 1921, **90,** 180-95).—Confirms on patients the fact of the synergic action of narcotine and morphine.—J. H. B.

3105. Ethanol, Caffeine, and Nicotine and Tadpole Development. D. I. Macht and W. Bloom (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 241-2).—Very young tadpoles succumbed much more quickly to all the poisons than the older ones. The most toxic of the drugs was nicotine, then caffeine, the least toxic being alcohol.—D. H. de S.

3106. Nachweis und Bestimmung des Morphins und anderer Alkaloide in tierischen Ausscheidungen und Organen. C. Wachtel (*Biochem. Zeit.*, 1921, **120,** 265-83).—After preliminary treatment, the morphine is precipitated in weakly acid solution with phosphotungstic acid, and the morphine content estimated by oxidation with ferricyanide to oxydimorphine.—H. K.

3107. Experimentelle Studien über die intravenöse Infusionsnarkose mittels Alcohols. K. Nakagawa (*Tohoku J. Exp. Med.*, 1921, **2,** 81-126).—Preliminary experiments *in vitro* showed that alcohol causes less hæmolysis and less damage to leucocytes than either $CHCl_3$ or ether of the same concentration in saline. Complete narcosis with no obvious bad after-effects was obtained by injecting the 2 latter substances ($CHCl_3$ 0·63% or ether 5%) intravenously in rabbits. Alcohol, thus indicated as a safe anæsthetic, was found to work efficiently when employed as a 10 or 15% solution in saline. Rabbits required from 35 to 45 c.c. per kilo, depending on the strength used, before they became fully "under," after which the anæsthesia could be maintained by injecting at the rate of 2 to 3 c.c. per min. Dogs needed rather larger doses, but in both narcosis was induced in little more than 16 mins. This time was somewhat shortened by using

a mixture of alcohol (3) and ether (1 or 2) made up to 10 or 15% strength in saline; the mixture had also the advantage of a short post-anæsthetic period. The usual fall in the blood-pressure and in the rate of breathing was observed, and occasionally transient albuminuria.—R. K. S. L.

3108. Zur Theorie der Desinfektion. J. Traube and R. Somogyi (*Biochem. Zeit.*, 1921, **120,** 90-9).— Experiments with staphylococcus and *B. coli* show that, apart from disinfectants of the type $KMnO_4$ and H_2O_2, which act chemically, physical forces are the deciding factor, such as surface activity, adsorption, flocculating and other properties.—H. K.

3109. Action of Diuretics. A. R. Cushny and C. G. Lambie (*J. Physiol.*, 1921, **55,** 276-85).—The rate of the blood-flow through the kidney was measured on the principle of Barcroft and Brodie's experiments, but with special cannulas and clamps, which are described. At the same time, the urine was measured and the changes induced by the intravenous injection of various drugs were examined. Of these, pituitary extract alone caused a diuresis which ran parallel to the rate of blood-flow, and which is therefore ascribed to the action on the circulation. Under caffeine the blood-flow is accelerated for a moment, but returns to the normal long before the diuresis has passed off, and the action is therefore situated in the glomerular capsule. The great flow of urine from salts and urea is often, but not necessarily, accompanied by acceleration of the renal circulation. No change in the amount of urine or in the blood-supply occurred under strophanthin. Adrenaline slows the blood-flow and lessens the urine in proportion, while section of 1 splanchnic nerve has the opposite effect.—*Author's Abstract.*

3110. The Styptic Effect of Ergot Preparations on Pulmonary Hæmorrhage. M. Maeda (*Tohoku J. Exp. Med.*, 1921, **2,** 1-8).— Ergot arrests pulmonary hæmorrhage through its constrictor action on the bronchial musculature; anæsthetics, especially urethane, so depress the bronchial tone that they render the subsequent introduction of ergot ineffective.—R. K. S. L.

3111. Zur Beschleunigung der Blutgerinnung durch Euphyllin. R. Meissner (*Biochem. Zeit.*, 1921, **120,** 197-202).— Euphyllin (an addition product of theophyllin and ethylenediamine) can accelerate blood-clotting even up to 50%. The components have individually also a weak action.—H. K.

3112. Über intravenöse Therapie und die Wirkung intravenös verabreichter hypertonischer Lösungen. W. Stejskal (*Wien. klin. Woch.*, 1921, **34,** 343-4).—Hypertonic solutions cause an inhibition of the secretions of glands.—H. W.

3113. Alkalosis and Tetany. I. Greenwald (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 228-34).—An attempt was made to induce symptoms resembling tetany by the intravenous injection of sodium bicarbonate into dogs under cocaine anæsthesia. Convulsions were produced, and there was a decrease in the H-ion concentration of the blood and plasma; but the change in reaction was never great, and was less during the convulsions than before. Rapid injection produced apnœa, with death from respiratory failure, and not convulsions. The bicarbonate content was greatly increased. Injection of HCl did not relieve the convulsions, but reduced the bicarbonate content. Similar experiments with other Na salts indicate that the concentration of Na in the plasma required to produce convulsions is approximately the same for sodium bicarbonate, chloride, phosphate, or sulphate. The author explains the results of the injection as being due to a disturbance in the equilibrium between the various ions within the body. —D. H. de S.

3114. Action of Mercury. W. Salant and N. Kleitman (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 249-50).—The action of mercury benzoate, succinate, and acetate, injected intravenously into dogs and cats in a concentration of 1: 5000, was studied. Small doses increased the frequency and depth of respiration; larger doses produced the

opposite effect, as also did repeated small doses. Small doses either had no effect upon the blood-pressure, or caused a temporary rise; repeated small doses caused a fall in blood-pressure and slowing or arrest of the heart, the fall in pressure being less abrupt and lasting longer if the vagi had been cut previously.—D. H. de S.

3115. Traitement de la syphilis par le bismuth. R. Sazerac and C. Levaditi (*Compt. rend.*, 1921, **173,** 338-40).—Favourable results (up to date of writing) with primary, secondary, and tertiary cases of syphilis after intramuscular injection of sodium potassium bismutho-tartrate in oil suspension.—J. H. B.

3116. Action du bismuth sur le trypanosome du nagana. R. Sazerac and C. Levaditi (*Compt. rend. soc. biol.*, 1921, **85,** 430-1).—The tartro-bismuthate of sodium and potassium will keep alive guinea-pigs infected with *T. nagana* for 80 days, as compared with 25 to 60 days in controls untreated. The compound is much less active against syphilis.—J. H. B.

3117. Ricerche farmacologische sul ferro. III. Azione del solfato ferroso. L. Sabbatani (*Arch. di fisiol.*, 1921, **19,** 57-76).—For previous work see Abstracts Nos. 882 and 2148, Vol. IV., pp. 144 and 343. Iron sulphate ($FeSO_4+7H_2O$) is toxic for the usual laboratory animals. The smallest fatal dose varies from 0·00040 gm. injected intravenously into rabbits to 0·00359 gm. injected into the dorsal lymph sac of frogs. The poisoning is characterised by general collapse, gastro-enteric disturbances, alterations of the blood, paralysis of the central nervous system and of the heart. Large doses injected intravenously are immediately fatal; their toxicity is due to the ferrous ion. Small doses allow the animals to survive a few hours; their action is probably due to other chemical factors resulting from a reaction of the animal tissues.—C. d. F.

3118. Über die Wirkung des Atropins auf den überlebenden Magen. P. Hecht (*Deutsch. Arch. f. klin. Med.*, 1921, **136,** 296-313).—Atropine causes excitation if the stomach is washed by repeated changing of the nutritive solution. Inhibition of the movements of the stomach was observed if substances (choline content of the intestine) were present which effect an excitation of peristalsis. The varying effect of atropine depends on the different content of choline. Acids or alkalis have no influence.—H. W.

3119. Nachtrag zum Aufsatze: Ein Vorlesungsexperiment. Direkte applikation von Giften auf das Rückenmark des Frosches. C. G. Santesson (*Skand. Arch. Physiol.*, 1921, **41,** 31-2).—See Abstract No. 3630, Vol. V., p. 573. Application of strychnine is now described.—C. L. E.

3120. Action du chlorhydrate d'émétine sur le cœur. F. Arrillaga and J. Guglielmetti (*Compt. rend. soc. biol.*, 1921, **85,** 596-7).—Doses of 0·1 gm. per kgm. body-weight of emetine chlorhydrate given intravenously to dogs produce heart-block and ventricular fibrillation leading to death.—J. H. B.

3121. Antagonism between Pilocarpine and Atropine on the Surviving Cat-Gut. W. S. van Leeuwen and (Miss) C. v. d. Broeke (*Proc. Kon. Ak. van Wet.*, **23,** 62).—In accordance with the results of de Jeude and others, the authors find that the action of pilocarpine on the gut is entirely dependent on the concentration of the drug in the solution. This action is completely reversible. Contrary to de Jeude, the antagonistic action of atropine depends entirely on the concentration, and not on the absolute amount of the poison present. With relatively small quantities of pilocarpine the amount of atropine required for the antagonism does not depend on the amount of pilocarpine administered, but chiefly on its action in each individual experiment. With higher concentrations of pilocarpine this is not the case.—R. B.

3122. Etude pharmacodynamique de l'adrénalone. Action vasoconstrictive et respiratoire; effets sécrétoires. E. Jaeger (*Compt. rend. soc. biol.*, 1921, **85,** 432-3).—Adrenalone is the methyl-amino derivative of acetyl pyrocatechol. This substance has a sympatho-mimetic action, as previously reported. On the respiration the action is

not identical with that of adrenaline. There is not a long period of apnœa (as with adrenaline), but there are very short cessations of respiration, or merely a slowing of respiration.—J. H. B.

3123. The Toxicity of Skatole. W. Salant and N. Kleitman (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 251).—Injections of skatole dissolved in acetone produce symptoms similar to those produced by injections of acetone only, but in dogs and cats the fall of blood-pressure is greater, and recovery takes longer, while in frogs the presence of skatole in the acetone injected leads to a fatal result.—D. H. de S.

3124. Die Erregung des überlebenden Uterus und Darmes durch Organextrakte und Dialysate (besonders aus dem Uterus). E. L. Backmann (*Pflüger's Arch.*, 1921, **189,** 261-81).—Extracts of uterus, intestine, and muscle in water, saline solution, or alcohol, cause contraction of the isolated uterus and intestine. The active substance is apparently not choline. Aqueous extracts of blood, especially of fresh blood, have a similar action. (The author does not seem to have considered the possibility of the presence of histamine or related substances.)—C. L. E.

PATHOLOGY

3125. L'électricité qui tue. M. D'Halluin (*J. de radiol. et d'électrol.*, 1920, **4,** 254).—Death from electricity may be of respiratory or cardiac origin. The serious nature of the latter, though often ignored, is due to persistent fibrillation, which must be distinguished from "folie ondulatoire," from which recovery occurs. Low-tension currents specially affect the heart. High-tension currents (1,200 volts upwards) inhibit the medulla and kill by asphyxia. Currents of 240 to 600 voltage produce both effects. Low-tension currents are not therefore harmless, but are most dangerous. Respiratory failure must be treated by accepted methods, but cardiac failure (diagnostic points are given) can only be restored by direct massage and oxygenation of the blood; intravenous injection of KCl (5%) helps. In dogs massage alone revived 37%; massage plus KCl 65%. The toxicity of KCl depends rather on injection rate than on dose. In dogs the lethal dose is 14 cgm. per kilo if injected 20 mgm. per min., but is 42 cgm. at the rate of 4 mgm. per min. per kilo of body-weight.—W. D. H. (*Med. Sci.*).

3126. Recherches expérimentales sur l'autocolloïdoclasie à frigore. F. Widal, P. Abrami, and E. Brissaud (*Compt. rend.*, 1921, **173,** 207-12).—Dogs were exposed to cold by immersion in water at 2° to 5° C. for varying periods. According to the length of time of immersion they suffered from manifestations of shock in varying degree. Short periods produced only a "crise hémoclasique" consisting of (1) leucopenia, white cells diminishing in 45 mins. from 12,000 to 5,000; (2) increase of lymphocytes and decrease of polymorph cells; (3) large decrease in clotting-time of the blood; and (4) diminution of the refractive index of serum. Further symptoms were pyrexia, dyspnœa, nausea, œdema, urticaria, and finally hæmoglobinuria. These symptoms are identical with those following intravenous injection of foreign protein in the dog, and with those of anaphylactic shock in the dog. These forms of shock are therefore all 3 identical; the authors give the name "colloïdoclasie" to the process involved.—J. H. B.

3127. The Alkali Reserve of Blood-Plasma during Anaphylactic Shock. A. A. Eggstein (*J. Lab. and Clin. Med.*, 1921, **6,** 555-60).—Acute anaphylactic shock in dogs is associated with an immediate and progressive acidosis, which appears before the onset of recognisable clinical symptoms of shock. When the CO_2 capacity of the blood-plasma falls below 25 volumes % the animal usually dies. The acidosis is quickly relieved after shock if the animal survives; the alkali reserve of the plasma is restored

to normal in less than 6 hours. The administration of sodium bicarbonate to the dogs before anaphylactic shock has apparently a beneficial influence upon the recovery of the animals, but will not always prevent death, even though the alkali reserve of the plasma is restored to normal or is above normal. Alkaline treatment of guinea-pigs preliminary to acute anaphylactic shock reduced the mortality 16·7%. Reasons for the unsuitability of rabbits for these experiments are given.—D. H. de S.

3128. The Alkali Reserve of the Blood-Plasma during Protein Shock. A. A. Eggstein (*J. Lab. and Clin. Med.*, 1921, **6**, 481-6).—In dogs and in human beings the alkali reserve of the blood-plasma is greatly decreased in shock following the intravenous injection of toxic proteoses and typhoid vaccines; this decrease in the alkali reserve bears a definite relationship to the lowered blood-pressure. The administration of sodium bicarbonate before the injection of a toxic protein retards the fall of the blood alkalis, and when the alkali reserve has been lowered in protein shock it may be restored by the intravenous administration of sodium bicarbonate, which apparently relieves distressing symptoms. When the alkali reserve of the blood falls below 30 volumes % following protein shock the animal's life is in danger.—D. H. de S.

3129. Certain New Conceptions of the Relation of the Liver to the Problems of Abdominal Surgery. G. W. Crile (*Amer. J. Obstet. and Gyn.*, 1920, **1**, 321-30).—In exhaustion and shock from any cause the electrical conductivity of the brain is diminished, while that of the liver is increased. Excision of the liver reduces the activity of the brain, the cells of which show structural changes. Heat applied to the liver, by increasing its metabolism, defends the whole organism.—C. L. E.

3130. El poder hemolitico de los sueros en la oclusion intestinal experimental. A. B. Ribeyrolles (*Semana méd.*, 1921, No. 24, 714).—L'occlusion intestinale chez le chien, augmente le pouvoir hémolytique du serum pour les globules rouges de mouton.—B. A. H.

3131. Disintegration of Hæmoglobin in Intestine. I. Snapper and J. J. Dalmeyer (*Ned. T. v. Gen.*, 1921, **65**, 1676).—In searching for blood in the fæces the reduced hæmatin test is a good one. The porphyrin spectrum should also be looked for. Absence of porphyrin is stated to negative malignant tumours, but the converse is not true.—R. B.

3132. The Medical Significance of the Disorders of Speech. S. Blanton (*J. Amer. Med. Assoc.*, 1921, **77**, 373-6).—Excluding organic aphasias, the author deals with 4 groups: (1) Delayed speech, (2) letter substitution, (3) oral inactivities of the articulatory organs, and (4) stuttering and stammering. These are symptom complexes which are often of value. The disorders are due to lack of ability to adapt emotionally to social situations or to faulty motor mechanism, hereditary or acquired. Treatment should be directed to the fundamental cause.—C. L. E.

3133. The Concentration of Sodium and Potassium as Compared with that of Calcium and Magnesium in the Serum of Patients with Infantile Tetany. F. F. Tisdall, B. Kramer, and J. Howland (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 252-3).—The Na and Mg contents are normal, the K content is somewhat raised, while the Ca content is very much diminished. The (Na+K)/(Ca+Mg) ratio in the normal infant is equal to 27·6; in cases of active infantile tetany it is 44·5. The change in the ratio is due almost wholly to the decrease in the concentration of the Ca.—D. H. de S.

3134. Food Allergy as a Cause of Abdominal Pain. W. W. Duke (*Arch. Int. Med.*, 1921, **28**, 151-65).—Hypersensitiveness to foods of different sorts may produce symptoms not unlike those of surgical abdominal conditions.—J. H. B.

3135. Studies on the Pneumonic Exudate—I., II., III., IV. F. T. Lord and R. N. Nye (*J. Exp. Med.*, 1921, **34**, 199, 201, 207, 211-6).—I. The proteolytic enzyme (Abstract No. 2556, Vol. IV., p. 410) retains its activity for 18 months, is not inactivated at

65° C., is not dialysable, and is not inhibited by NaCl. II. Normal serum and cellular material in early stages of pneumonic exudate contain an anti-enzyme. III. Specific precipitins are present in the exudate. IV. Specific agglutinins for the homologous pneumococcus are masked by the presence of inhibiting substances in the lung.—C. L. E.

3136. New Treatment of Trypanosomiasis. C. H. Marshall (*Trans. Roy. Soc. Tropical Med. and Hyg.*, 1921, **15,** 10-23).—The author, realising that trypanosomes in the cerebro-spinal fluid are in a harbour of refuge, and are thus unaffected by drugs administered in the usual way, injected neo-kharsivan (a soluble form of salvarsan) intrathecally and killed the parasites in the fluid, and incidentally the patient as well. So he gave this method up and injected the drug into the blood, and shortly afterwards bled the patient, allowed the blood to clot, and injected 20 minims of the serum into the cerebro-spinal fluid. One treatment resulted in cure in 46 out of 52 cases; of the 6 who died, 4 died of other complaints. It is suggested that the method should be extensively tried for the cure of the "fly" diseases of animals. The cure is attributed, not to the arsenic in the blood, but to a trypanolysin formed there, which view is supported by the fact that in 1 case the serum alone without salvarsan treatment acted in the same way.—W. D. H.

3137. The Specific Exhaustion of Cutaneous Reactions. G. M. Mackenzie and L. B. Baldwin (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 214-7).— Urticaria-like skin reactions were obtained in hypersensitive patients, the subjects of hay fever or bronchial asthma, by means of egg-white and other proteins, and extracts of ragweed and chicken feathers. It is possible to exhaust and actually to abolish locally the reactivity of the skin. Observations on the exhaustion are not yet complete, but suggest a certain amount of specificity.—D. H. de S.

3138. Über die Pigmentbildung bei Morbus Addisonii. A. Bittorf (*Deutsch. Arch. f. klin. Med.*, 1921, **136,** 314-22).—The hyper-pigmentation in Addison's disease is caused by an increase of the oxidase (dopaoxidase) in cells of the skin.—H. W.

3139. Du mode d'action de l'adrenaline et des acides vis-à-vis des toxines bactériennes. S. Tawara (*Compt. rend. soc. biol.*, 1921, **85,** 401-2).—The action of adrenaline in rendering mice immune to tetanus toxin is due to the acid which commercial samples of adrenaline contain. Strong acids can neutralise tetanus toxin, and, when using guinea-pigs as experimental animals, diphtheria toxin also.—J. H. B.

3140. Über heterogenetisches Antigen und Hapten. XV. Über Antigene. K. Landsteiner (*Biochem. Zeit.*, 1921, **119,** 294-306).— The soluble heterogenetic antigens obtained from horse kidney by alcohol extraction are as active *in vitro* as the unchanged materials, but when injected do not produce hæmolysin.—H. K.

3141. Thermolability of Complement in Relation to the H-Ion Concentration. C. B. Coulter (*J. Gen. Physiol.*, 1921, **3,** 771-82).—Destruction is least at P_H between 6·1 and 6·4. It is supposed to represent the isoelectric point of a euglobulin contained in the mid-piece. On the alkaline side of the above, NaCl protects from destruction, but has no effect on the acid side.—W. M. B.

PLANT PHYSIOLOGY

CHEMICAL

3142. Mutual Precipitation of Dyes and Plant Mucilages. F. E. Lloyd (*Trans. Roy. Soc. Canada*, 1920, 23-31).—It is shown that those dyes which are adsorbed by the mucilage of *Opuntia* lower its viscidity with a rapidity directly related to the vigour with which they are adsorbed.—C. W.

3143. Untersuchungen über lichtkatalytische Vorgänge von physiologischer Bedeutung. K. Noack (*Zeit. f. Bot.*, 1920, **12,** 273-347).—The author divides light catalysts producing physiological changes into 2 groups: (1) Fluorescent organic substances, and (2) salts of heavy metals and fluorescent anthracene derivatives. Both work by transference of oxygen. The second group cannot produce the changes carried out by the first. Respiratory chromogens were oxidised in light by eosin, methylene blue, and quinine sulphate in the same way as by H_2O_2. This action could be arrested by reducing salts, but not by NaCl, Na_2SO_4, or $NaHCO_3$. On the other hand, it was accelerated by manganese sulphate. It was shown that sodium sulphate, by its reducing properties, could completely inhibit the " photodynamic " action of fluorescent organic substances. Here also $MnSO_4$ acted as an accelerator. It was concluded that the first group of catalysts acted by forming peroxides. The metallic catalysts did not act in this way. Small quantities of sulphite caused decreased bubbling by Elodea. This was not due to reaction of chlorophyll with sulphite. The action of $MnSO_4$ is not in agreement with Neuberg's views of this substance as a light catalyst.—G. E. B.

3144. Über die Fluoreszenz des Chlorophylls und ihre Bedeutung beim Assimilationsprozess. K. Stern (*Zeit. f. Bot.*, 1921, **13,** 193-230).—The light from the red end of the spectrum was removed from the incident beam by an ammoniacal solution of copper oxide. The light from material or solution to be tested for fluorescence was examined by means of a spectroscope. The chlorophyll in the living cell (a suspension of *Chlorella* was used) showed fluorescence. Since only true solutions, and not colloidal or solid chlorophyll, show fluorescence, it is concluded that at least some of the chlorophyll in the living cell is in true solution. The fluorescence band of chlorophyll in the cell agrees very closely in position with that of a solution of chlorophyll in lecithin. There is no marked difference between the intensity of the fluorescence of an assimilating and of a non-assimilating cell.—G. E. B.

3145. Étude de la variation des acides organiques au cours de la pigmentation anthocyanique. D. Kohler (*Rev. gén. de Bot.*, 1921, **33,** 295-305, 337-56).—In the corolla of *Cobœa scandens* and the leaves of *Ampelopsis tricuspidata* the formation of anthocyan is accompanied by increasing concentration of organic acids (details of technique given in first instalment). No change of concentration was observed before appearance of pigmentation. In the hypocotyls of buckwheat the formation of anthocyan is accompanied by decrease in the concentration of organic acid. When pigmentation takes place after separation of the organ from the plant, no change in concentration of organic acid was observed. The bearing of these and other facts on the views of Combes and Nicolas on anthocyan formation are discussed.—G. E. B.

3146. Sur la teneur des algues marines en matières minérales. L. Lapique and M. Lapique (*Comp. rend. soc. biol.*, 1920, **83,** 1610-3).—In different Laminariaceæ salts comprised up to 54% of the dry weight; these salts mostly consist of chlorides. The concentration of the cell sap of Laminariaceæ is somewhat smaller than that of the surrounding sea-water.—W. S.

3147. On Carrageen (Chondrus crispus). II. On the Occurrence of Ethereal Sulphates in the Plant. P. Haas (*Biochem. J.*, 1921, **15,** 469-76).—The colloidal material extracted from this plant with hot water consists of a mixture of 2 substances which can be separated from one another on account of their different solubilities in cold water, the constituent more soluble in cold water giving a thick viscous solution, while the less soluble dissolves more readily in hot water, the solution tending to gelatinise on cooling. The latter substance is the Ca salt of an ethereal sulphate.—W. S.

3148. " Fumed " Oak and Natural Brown Oak. C. K. Tinkler (*Biochem. J.*, 1921 **15,** 477-86).—The brown coloration of fumed oak is produced by the combined action of ammonia and atmospheric O; if the latter alone is absent, English oak shows a reddish

coloration, while other kinds of oak show little coloration or none. The reddish-brown colour of natural brown oak may be due partly to the interaction of tannin with a nitrogenous compound and partly to the presence of a phlobaphene.—W. S.

3149. The Behaviour of Pectin towards Alkalis and Pectase. F. Tutin (*Biochem. J.*, 1921, **15,** 494-7).—Pectin from apples was treated in cold aqueous solution with 13·4% of its weight of NaOH, and after 30 mins. made slightly acid and distilled. Both acetone and methyl alcohol are formed, and to the same extent as when the distillation is conducted in presence of considerable excess of alkali. The action of the enzyme pectase is similar.—W. S.

3150. Sur l'application, aux végétaux, du procédé biochimique de recherche du glucose. M. Bridel and R. Arnold (*Bull. soc. chim. biol.*, 1921, **3,** 297-306).—The method used by the authors is based on the following principle: If to a solution of a mixture of reducing substances in methyl alcohol of known strength emulsin is added, and a diminution of reducing power results, the diminution of reducing power is due to the combination of the glucose with methyl alcohol to form the non-reducer β-methyl glucoside. This principle was applied to strawberries, raisins, and leaves of *Eucalyptus globulus*. —W. S.

3151. Adaptation of a Yeast to Galactose. H. von Euler and I. Laurin (*Arkiv Kem. Min. Geol.*, 1920, **7,** No. 28, 1-11).—The circumstances attending the increase in the velocity of fermentation produced by yeast water render it probable that Harden's co-enzyme, by furthering the growth and increase of the yeast, exerts a marked influence on adaptation phenomena. Extraction of carefully dried yeast leads to a condition of the cells in which these exhibit fermenting power far exceeding that of fermentation by zymase, and yet cease to grow. This indicates that, by suitable treatment, a growth activator may be withdrawn from yeast, whilst the fermentation activator still remains in the cells.—W. S. (*J. C. Soc.*).

3152. Thiocyanic Acid in Plants. S. Dezani (*Staz. sperim. agrar. ital.*, 1920, **53,** 438-50).—Thiocyanic acid was absent from extracts of the bulbs of *Allium cepa*, the seeds of *Phaseolus vulgaris* and *Pisum sativum*, wheat flour, carrots, apples, chicory, endive (leaves), and spinach; but its presence was indicated in extracts of the roots of *Brassica rapa*, *Cochlearia armoracia*, and *Raphanus sativus*, in the fresh leaves of *Raphanus raphanistrum*, *Thlaspi bursa pastoris*, *Calepina corvini*, *Sisymbrium alliaria*, *Sisymbrium officinale*, *Nasturtium officinale*, *Bunias erucago*, *Eruca sativa*, *Sinapis alba*, *Sinapis nigra*, and *Sinapis arvensis*. Positive reactions in hay are probably due to the presence of cruciferous plants. The thiocyanic acid, where found, is probably present as such, and is not a decomposition product of allylthiocarbimide.—W. S. (*J. C. Soc.*).

3153. Calcium Thiosulphate in Achromatium oxaliferum, Schew. G. Hannevart (*Bull. Acad. Roy. Belg.*, 1920, 600-5).—In the vacuoles of *Achromatium oxaliferum*, Schew., sulphur granules occur accompanied by calcium thiosulphate. The vacuolar substance disappears at 50° to 60°, and sulphur separates. In pure water the bacteria quickly lose all sulphur by change to H_2S.—W. S. (*J. C. Soc.*).

ENZYME ACTION

3154. Oxydation de la glycérine par le Bacillus subtilis. E. Aubel (*Compt. rend. soc. biol.*, 1921, **84,** 574-6).—Cultures of *B. subtilis* were grown for 10 days in nutrient solutions containing glycerol, and then extracted with ether. In the ether extract the following substances were indicated: Pyruvic acid, acetyl methyl carbinol, and dihydroxyacetone. It is suggested that the successive steps in the oxidation of glycerol are dihydroxyacetone, methyl glyoxal, pyruvic acid.—W. S.

3155. On the Deterioration of Cotton on Wet Storage. Nancy Fleming and A. C. Thaysen (*Biochem. J.*, 1921, **15,** 407-14).—Changes occur in the structure of cotton

fibres when attacked by bacteria, and this fact forms the basis of a method for the quantitative determination of the bacterial deterioration of cotton. The presence of a large number of micro-organisms in raw cotton indicates that the cotton has been exposed to damp; smaller numbers, up to a few million per grm., are due to contamination either by exposure on the fields or during other stages of its preparation. Samples of cotton grown in India from Indian seed deteriorate more quickly, on account of bacterial attack, than American cottons, but cotton grown in India from American seed was as resistant to attack as American cotton.—W. S.

3156. Influence of Fermentation on the Starch Content of Experimental Silage. A. W. Dox and L. Yoder (*J. Agric. Res.*, 1920, **19,** 173-9).—No chemical or microscopic changes could be observed in the starch of maize during the process of fermentation in the silo.—V. H. B.

VEGETATIVE DEVELOPMENT

3157. Effect of Reaction of Solution on Germination of Seeds and of Growth of Seedlings. R. M. Salter and T. C. McIlvaine (*J. Agric. Res.*, 1920, **19,** 73-95).—The growth of seedlings of wheat, maize, soy-beans, and alfalfa was studied in water culture in relation to the P_H value of the solution. Maximum growth of maize was found with a P_H 5·16, while in the other 3 the value was 5·94. The plants showed a general tendency to bring the reaction of the solution towards a point slightly below neutrality. The optimum for germination lay between 7·71 and 2·96.—V. H. B.

3158. The Sowing of Beans and Other Seeds. H. E. Durham (*Gard. Chron.*, 1921, **70,** 35).—Advocates surface-sowing of runner and dwarf beans; this method ensures the rapid greening of the cotyledons.—C. W.

GROWTH OF LOWER PLANTS

3159. The Synthesis of Vitamin B by Yeasts (Preliminary Note). A. Harden and S. S. Zilva (*Biochem. J.*, 1921, **15,** 438-9).—*S. ellipsoideus* produces vitamin B. Yeast grown on synthetic media contain this vitamin, but not in so large a proportion as those grown on wort.—J. C. D.

3160. On Some Characters of the Cleavage Products of Certain Bacteria, with Special Reference to their Toxicity and Antigenic Properties. S. R. Douglas (*Brit. J. Exp. Pathol.*, 1921, **2,** 175-91).—Emulsions of acetone-extracted bacteria which have been digested with trypsin for a suitable period have a toxicity which is the same as, or at times greater than, that of emulsions of untreated bacteria of equal density. The toxin present in the tryptic digests is the specific bacterial endotoxin which is usually produced in the body by the lytic action of the body fluids. Antitoxin prepared by the injection of untreated bacteria completely neutralises the toxic properties of the tryptic digests. When bacterial digests are injected into animals, the bactericidal and precipitating powers are greatly increased. Antitoxin is also formed, but there is no increase of either the agglutinating or opsonic powers. Digestion of the bacteria *in vitro* presents the endotoxin preformed to the body, and so may lead to the production of much more potent antitoxic sera.—*Author's Abstract* (*abbreviated*).

3161. Denitrification as a Means of Sewage Purification. E. A. Cooper (*Biochem. J.*, 1921, **15,** 513-5).—Sewage constituents can reduce considerable amounts of nitrate in a relatively short time. Very considerable purification of sewage can be effected by the utilisation of nitrates by the reducing micro-organisms present in the sewage.—W. S.

3162. Proteolytic Activity of Lactic Organisms. V. Phenomena of Sudden Physiological Mutation. C. Gorini (*Atti R. Accad. Lincei, Rendiconti*, 1921, [5], **30,** i., 312-5).—Lactic acid organisms can exhibit sudden mutation and retro-mutation in acidifying

and proteolytic activity, the new properties so acquired being transmissible independently of external conditions.—W. S. (*J. C. Soc.*).

CROP YIELD

3163. Practical Universality of Field Heterogeneity as a Factor influencing Plot Yields. E. S. Schultz and D. Folsom (*J. Agric. Res.*, 1920, **19,** 279-314).—A number of published cropping results are treated statistically, and the correlation coefficients show that heterogeneity of the soil is universal, and is even well marked in fields considered eminently suitable for agricultural experiments.—V. H. B.

3164. Experiments on the Spacing of Potato Plants. F. C. Stewart (New York [Geneva] Agric. Exp. Stat., *Bull.* **474,** 1920, 1-32).—Potatoes grown on rich garden soil for table use may be planted as close as 6 by 30 ins. with advantage.—C. W.

3165. Selection of Seed Potatoes. W. H. Taylor (*New Zealand J. Agric.*, 1921, **32,** 42-3).—A general discussion.—C. W.

RESPIRATION

3166. Respiration. XV. The Effect of Bile Salts and Saponin. Matilda M. Brooks (*J. Gen. Physiol.*, 1921, **3,** 527-32).—The rate of respiration of *Bacillus subtilis* is increased by sodium taurocholate in concentrations of 0·0000125 m., and decreased at and above 0·001 m. NaCl is antagonised by taurocholate in molecular proportions (1 part of the former to 14,375 of the latter). Saponin in 0·00005 m. to 0·001 m. decreases rate of respiration, and has no effect in lower concentrations.—W. M. B.

3167. Observations sur la résistance des végétaux à l'asphyxie. L. Maquenne and E. Demoussy (*Bull. soc. chim. biol.*, 1921, **3,** 273-8).—Submerged seeds of a number of species will germinate if the water is kept in circulation so that the necessary oxygen (in solution) is supplied to the seed. Leaves can be kept alive under aerated water if this is kept in circulation. Leaves which blacken by oxidase action, after being killed by asphyxia, do not blacken in stagnant water deprived of oxygen, but will do so in circulating water containing dissolved oxygen.—W. S.

WATER RELATIONS

3168. On the Contractility of Amputated Parts of Plants. A. D. Waller (Proc. Physiol Soc., *J. Physiol.*, 1920, **54,** lv-lvii).—Contraction of amputated parts of plants may be due to changes in turgor, and are not to be regarded as analogous to contractility of animal tissues.—W. S.

3169. Osmotic Pressure, Root Pressure, and Exudation. V. H. Blackman (*New Phyt.*, 1921, **20,** 106-15).—A discussion of the relation of root pressure and exudation to osmotic pressure, with special reference to the theories of Lepeschkin and Priestley. It is shown that Lepeschkin's claim that the osmotic pressure of the stronger cell contents is responsible for the exudation from the cell of a weaker solution cannot be substantiated.—W. S.

IRRITABILITY AND MOVEMENT

3170. The Reversal of Geotropic Response in the Stem. I. The Effects of Various Percentages of Carbon Dioxide. M. J. Lynn (*New Phyt.*, 1921, **20,** 116-23).—Seedlings of *Helianthus annuus* were placed horizontally in an atmosphere to which known percentages of CO_2 had been added. When the concentration of CO_2 was above 7 to 10% the hypocotyls curved downwards. That this represented a reversal of geotropic curvature was shown by experiments on seedlings revolved on a klinostat with horizontal axis.—W. S.

3171. Über die Reaktionen freibeweglicher pflanzlicher Organismen auf plötzliche Änderungen der Lichtintensität. R. Harder (*Zeit. f. Bot.*, 1920, **12,** 353-462).—The

following conclusions with regard to the reaction of Nostoc hormogonia to sudden changes of light intensity were reached: The reaction was a reversal of the motion, but this was only observed when the light intensity was decreased. For the reaction a definite presentation time of original light (L) was necessary—Lichtpräsentationszeit (Lpz.)—and likewise for the weaker light (B) after the sudden change in intensity—Beschattungspräsentationszeit (Bpz.). Between these 2 times an inverse relationship held, but this was not exact. The product of the 2 times decreased with increasing Lpz. The more intense was L reduced the sensitivity of the hormogonia, often resulting in an increase of Bpz. When light quantity of L was kept constant by increasing the intensity and shortening the time the Bpz. was increased. Doubling the light quantity by doubling the time shortened Bpz., whilst doubling the intensity resulted in only a slight decrease or even an increase in Bpz. For a given Bpz. the light quantity of L is greater the greater the intensity of L; the Lpz. is usually smaller, but may be greater, despite the increased intensity. In all the above the intensity of B is the same. The intensity of B (for constant Bpz.) was increased with increased intensity of L, and also the successive increments of B for given increments of L (*cf.* Weber's Law). If the time of L was increased by intervals, the corresponding increases in B became successively greater, but not to such an extent as when the intensity of L was changed. Stimuli too weak to cause a response could be integrated, but the relaxation time is short. The response took place in 3 phases—slowing up, rest, and recommencement in opposite direction—all or some of these phases being present according to the intensity of stimulus. The factors affecting the latter were time of L, time of B, difference between intensity of L and B. The reaction time for different phases depended upon the strength of stimulus. That for recommencement of movement was longer the stronger the stimulus, that for reversal was shorter. The latter gradually came to a minimum, and then remained constant. The motor mechanism was strongly affected by light, being much more sluggish in the dark. Recommencement of movement and reversal are quite separate. The irritability varied in a single individual. When not stimulated, the hormogonia assumed an " Unterempfindlichkeits " state. In this state they had a long presentation time, which decreased with repeated stimulation, at first rapidly, and then slowly, to a constant value. There was no sign of fatigue after several hundred stimulations.—G. E. B.

3172. The Tropistic Action of Red Light upon " Dunkelpflanzen " of Avena sativa. Clara Zollikofer (*Proc. Kon. Ak. van Wet.*, **23,** date, page, etc., not supplied).—Experiments were made on the action of red light upon the longitudinal growth of coleoptiles and upon the phototropic reactions with a view to finding a limit above which the influence of relighting must be taken into account in experiments in the dark room. Growth increased at first, then its velocity diminished considerably, after which it rose again to its original height to remain constant. The author considers this as a growth reaction to light with a quite characteristic course. Very small quantities of light were sufficient to cause phototropic bending of the coleoptiles. The reaction is nearly the same for all quantities of light which were used. A short negative reaction was always observed between 2 positive ones. The conclusion may be drawn that in future still greater care in the use of red light should be practised.—R. B.

GENETIC FACTORS

3173. Pollination in Orchards. IV. Self-Fertility and Self-Sterility in Plums. A. N. Rawes (*J. Roy. Hort. Soc.*, [Lond.], 1921, **46,** 353-6).—A preliminary account of investigations carried out at Wisley on self-fertility and self-sterility of several varieties of plums.—C. W.

ENVIRONMENTAL FACTORS

3174. The Influence of Cold in Stimulating the Growth of Plants. F. V. Colville (*J. Agric. Res.*, 1920, **19,** 151-60).—A very interesting address on the important part played by chilling in the life-processes of plants, and especially of its effect in bringing to an end the dormant condition. It is suggested that the cold increases the permeability of the plasma membranes, and so allows the enzyme to reach the starch and convert it into sugar, the high osmotic pressure thus induced bringing about the opening of buds. Pruning, girdling, notching, and even rubbing the stem, have the same effect by producing injuries which increase permeability.—V. H. B.

3175. Effect of Premature Freezing on Composition of Wheat. M. J. Blish (*J. Agric. Res.*, 1920, **19,** 181-8).—Immature wheat grains, when frozen in the field as a result of late planting, show larger amounts of non-protein nitrogen, reducing sugars, and acid reacting constituents than do normal grains. The non-protein nitrogen shows a considerably higher percentage of *a*-amino nitrogen.—V. H. B.

3176. Presoak Method of Seed Treatment. H. Braun (*J. Agric. Res.*, 1920, **19,** 363-92).—By soaking seeds of cereals in water for 6 hrs., or, better, by soaking for 10 mins., and then keeping moist and covered for 6 hrs., the injurious effect of formalin and copper sulphate used as steeps can be avoided.—V. H. B.

STORAGE

3177. The Handling and Storage of Apples in the Pacific North-West. H. J. Ramsay, A. W. McKay, E. Markell, and H. S. Bird (U.S. Dept. Agric., *Bull.* **587,** 1917, 1-31).—Gives the results of cold-storage tests at 32° F. and 35° F. respectively. Immature picking results in the development of scald (a physiological disease) and early decay of apples in storage. The storage of overmature apples is an equally bad or worse practice than the storage of immature apples. Well-coloured portions of the skin seldom, if ever, develop scald.—C. W.

3178. Preliminary Report of Pear Harvesting and Storage Investigations in Rogue River Valley. C. I. Lewis, J. R. Magness, and C. C. Cate (Oregon Agric. Exp. Stat., *Bull.* **154,** 1918, 3-24).—No correlation was found between size of fruit and keeping quality of pears picked from the same tree at the same time. Results are given of tests conducted with fruit stored under various conditions—*e.g.*, dry or ventilated storage, common humid storage, cold dry storage, cold humid storage, etc.—C. W.

3179. Pear Harvesting and Storage Investigations in Rogue River Valley (Second Report). C. I. Lewis, A. E. Murneek, and C. C. Cate (Oregon Agric. Exp. Stat., *Bull.* **162,** 1919, 5-39).—A statistical study on the increase in size of Bartlett pears warrants the following statements: Fruit of this variety increase *gradually* in size, but at an accelerated rate in volume, throughout the growing season. This result appears to be quite independent of climatic or cultural conditions. Linear enlargement in transverse diameter of the fruit is proportionally faster throughout the season than the longitudinal enlargement. It is suggested that seeds probably have an influence upon the form of pears. A distinct correlation appears to exist between the degree of maturity of pears and resistance to pressure of tissues of the cortex and epidermal regions. The results of storage investigations with Bartlett and with Bosc pears are recorded.—C. W.

3180. Cold Storage for Iowa Apples. W. E. Whitehouse (Iowa Agric. Exp. Stat., *Bull.* **192,** 1919, 179-216).—Temperature is a very important factor in the control of the so-called " scald " of apples, which is a physiological disease. The degree of humidity bears some relation to the development of apple scald, but temperature has a greater

influence. Immature fruit scalds readily in cold storage. No correlation was found between the size of the apples and the amount of scald developing on them during storage; 30 to 60 hours are required to reduce the temperature of apples in the centre of a box or barrel from a temperature of 70° to 35° F.—C. W.

3181. Fruit Cool Storage. W. H. Rice (*New Zealand J. Agric.*, 1921, **32,** 25-33).—Deals with the effect of the stage of maturity at picking upon the cool storage of 8 varieties of apples and 3 varieties of pears.—C. W.

THE SOIL

3182. Report on Potato Trials, 1920. Anon. (*J. Min. Agric.*, 1921, **28,** 350-61).—Gives results which show the effect of soil on the comparative cropping qualities of several varieties of potato.—C. W.

3183. Liming. J. J. Griffith (*J. Min. Agric.* [Lond.], 1921, **28,** 341-9).—Gives evidence in support of the view that the practice of liming should become much more general if soil fertility is to be raised.—C. W.

3184. Dry Farming. R. McGillivray (*New Zealand J. Agric.*, 1921, **32,** 19-24).—The fundamental principles of what is called " dry farming " or " dry culture " concern the storage in the soil of the annual rainfall, its retention there until required, the prevention of direct evaporation, the choice of plants suitable to arid conditions, and the sowing of drought-resisting strains. " Dry farming " may therefore be further defined as the intensive cultivation of the soil in countries of scanty rainfall to conserve moisture.—C. W.

3185. Arsenic as a Normal Constituent of Soils. F. Reichert and R. A. Trelles (*Anal. Soc. Quim. Argentina*, 1921, **9,** 89-95).—Soils from various parts of the Argentine all contained As. It is not possible to correlate its amount with the chemical composition of the soil. Up to 2·25 mg. per 100 grms. of soil were found. The amount of arsenic found is greater at the surface than below.— W. S. (*J. C. Soc.*).

3186. La réaction des sols et ses applications en agronomie. A. Demolon (*Ann. sci. agron. franç. et étrang.*, 1920, **37,** 97-114).—Summary article.—W. S. (*Ber. ü. d. ges. Physiol.*).

3187. La toxicité du borax pour les végétaux. Note critique. A. Bruno (*Ann. sci. agron. franç. et étrang.*, 1920, **37**, 185-90).—A review of experimental results obtained in the United States.—W. S. (*Ber. ü. d. ges. Physiol.*).

PATHOLOGY

3188. Artificial and Insect Transmission of Sugar-Cane Mosaic. E. W. Brandes (*J. Agric. Res.*, 1920, **19,** 131-8).—The cell sap is infectious when injected into young parts of plants, but mature leaves at the time of inoculation never show mosaic. The corn aphis, *Aphis maidis*, can transmit the disease. The view is held that the disease is not a " physiological " one, but that the cell-sap of the infected plants " contains some organism not visible by ordinary means."—V. H. B.

3189. Transmission of the Mosaic Disease of the Irish Potato. E. S. Schultz and D. Folsom (*J. Agric. Res.*, 1920, **19,** 315-37).—The disease can be transmitted by means of tubers, grafting, inoculation of plant juice, and by aphides. For infection in the field the aphis is responsible, so that control of these, and possibly of some other kinds of insects, is the most important means of checking the spread of potato mosaic. No evidence of soil infection was obtained.—V. H. B.

3190. Destructive Foliage Diseases of the Potato. Anon. (Iowa State Coll. of Agric. Extension, *Bull.* **56,** 1917, 1-11).—Includes a description of certain physiological diseases of the potato plant.—C. W.

3191. Über die Blattfleckenkrankheit der Tomate hervorgerufen durch Septoria lycopersici. K. Killian (*Zeit. f. Pflanzenkrk.*, 1920, **30**, 1-17).—The disease is carried on from year to year by means of the fruiting bodies of the fungus, which are found on the previous year's dead leaves. The fungus, though a strict parasite, can be grown on a large variety of artificial media, though the amount of growth is found in all cases to be somewhat limited. Reproductive organs are only formed at a late stage, when the nutrient in the substratum has been exhausted and vegetative growth has ceased to take place. The entrance of the fungus into the host plant through the epidermis and its behaviour to the various tissues are described and figured.—W. B.

3192. Zur Kenntnis der Verhältnisse zwischen Mistel und Birnbäumen. E. Heinricher (*Zeit. f. Pflanzenkrk.*, 1920, **30**, 41-51).—A case is described in which the reaction of a pear tree to a first infection with mistletoe seed was very strong, whereas a second infection of the same tree gave no reaction for a long time, though later the typical reaction of the host followed. These observations are considered to indicate a toxin-antitoxin relationship in the present case.—W. B.

3193. Die fungizide Wirkung der verschiedenen Metalle gegen Plasmopara viticola und ihre Stellung im periodischen System der Elemente. A. Wöber (*Zeit. f. Pflanzenkrk.*, 1920, **30**, 51-9).—Maximal fungicidal action is shown by copper, silver, and mercury. These occupy corresponding positions in periods II., III., and V. In each period the fungicidal activity of a particular metal is less the farther removed it is from the metal of maximal activity.—W. B.

BOOK REVIEWS

A Manual of Veterinary Physiology. By Major-General Sir F. Smith, K.C.M.G., C.B. Fifth Edition. Pp. xvi+892. London: Baillière, Tindall and Cox, 1921. Price 31s. 6d. net.

Sir Frederick Smith's "Veterinary Physiology," which first appeared in 1892, has undergone much change both in scope and in character. It deals still, as hitherto, chiefly with the physiology of the horse. But, originally an elementary work designed for veterinary students, it is now much more extensive, and better fitted to supply the practitioner with categoric dicta than the student with explanations of the processes of life. It contains too much undigested and unexplained detail and too many arithmetical inaccuracies to serve as an authoritative source of physiological information. On the other hand, it provides much interesting and helpful description of physiological anatomy, together with unusually full and valuable accounts of the alimentary canal, of locomotion, and of reproduction. The index is especially excellent, and reduces to a minimum the labour of reference to the authorities cited as well as to the details of the subjects presented.—W. L. S.

Tables, Factors, and Formulas for Computing Respiratory Exchange and Biological Transformations of Energy. By T. M. Carpenter. Carnegie Institute, Washington, Publication No. 303, 1921, pp. 123.

This book will be a welcome time-saver to all engaged in metabolism work. The first 10 tables are the usual ones for gas correction. Others give the volumes of oxygen in incoming air corresponding to 100 volumes of outgoing air with different percentages of nitrogen; the calorific values of oxygen and carbon dioxide, and proportions of energy from carbohydrate and fat consumed; the heat production per minute, hour, and day, calculated from oxygen consumption per minute at R.Q.=0·82; 3 tables are for calculating body surface, and 11 are basal metabolism prediction tables.—C. L. E.

Proc. Soc. Exp. Biol. and Med. Memorial Number for Samuel James Meltzer, M.D. New York, 1921.

The sad death of Professor Meltzer has already been noticed in these pages. He was the founder of the Society mentioned above, and it is most appropriate that it should issue a memorial number. It contains a portrait, a brief account of his life, and appreciative words by G. N. Calkins (the present president), G. B. Wallace, P. A. Levene, Graham Lusk, W. H. Howell, and W. H. Welch.—W. D. H.

Ergebnisse der Physiologie. By L. Asher and K. Spiro. J. F. Bergmann, 1921, **19,** pp. xxxiv+622. Mk. 175 plus Zuschlag.

Contains the following articles: "Physiology and Psychology of Taste," H. Henning; "The Biological Effects of Light," L. Pincussen; "The Residual Carbon of the Blood," W. Stepp; "The Significance of Radioactivity," H. Zwaardemaker; "The Physiology of Adaptation," H. Przibram; "Nerve Regeneration and Related Problems," J. Boeke; "The Physiological Significance of Ammonia," P. Albertoni. Also an obituary of Friedrich Schenck.—C. L. E.

Biological Chemistry. By H. E. Roaf. Crown 8vo., p. 216. Methuen and Co., Ltd. 10s. 6d. net.

To cover the wide field of biochemistry in some 200 small pages is no light task, and on the whole we think that, in the space available, too much has been attempted. The impression is gained that the author has striven to compress the contents to the smallest possible extent; throughout he is invariably concise, sometimes almost to the point of obscurity. There is also a lack of uniformity in the demands made on the reader's previous knowledge, and this is one of the reasons why we find difficulty in suggesting to what student it might be recommended as a sole textbook on this subject. As might be expected, the general tendency of the book is physico-chemical. Apart from numerous typographical errors, a certain amount of loose expression has found its way into the text. To give two examples only: On page 10 we find "*methyl glucose is the compound of glucose with a methyl group,*" and on page 155, "*all organic compounds can take up oxygen, and are finally converted into carbon dioxide and water.*" The diagrams and illustrations on the whole are good, though those of the phenylosazones of galactose and lactose on page 6 and that of a fish gill on page 157 might be replaced, as at present they convey but little information. The general references at the end of each chapter are few, but well chosen; but it is regrettable that editions of the "Monographs on Biochemistry," other than the most recent, are given in some cases. Incidentally this has led to error in the nomenclature of two methylxylosides. We would suggest that the recent work of Werner on the constitution of urea be considered, as it appears to offer the most satisfactory explanation of the hydrolysis of this substance by acids, etc. Apart from these relatively unimportant points, there is one sentence with which the majority of workers will join issue—viz. (page 104), "*after some plausible hypothesis has been developed, it is tested experimentally.*" This appears to us as liable to convey to the student a totally erroneous impression. Despite this somewhat destructive criticism, we are of the opinion that Professor Roaf's book may be read with profit as a companion to other works on the same subject, which, as a rule, is treated more from the conventional organic chemist's point of view.—J. A. H.

The Physical Properties of Colloidal Solutions. By E. F. Burton. Pp. 221. London: Longmans, 1921. Price 12s. 6d. net.

The second edition of this useful monograph has been brought up to date. It gives an excellent and full account of Brownian movement, optical properties, electric charge and coagulation, together with a chapter on the theory of the stability of colloidal

solutions. It is intended for the physicist, so that the special properties of emulsoids, of interest chiefly to the physiologist, are not so fully described as those of the suspensoids. The physicist, however, would be interested in the osmotic phenomena and the Donnan equilibrium, which might well be included in a future edition. The common error of attributing the discovery of the dispersion of light by colloidal solutions to Tyndall, instead of to Faraday, is repeated here, although it was just this fact that led the latter to a correct view of the nature of his gold sols. Tyndall showed later that the laterally dispersed light was polarised. The monograph may be thoroughly recommended.—W. M. B.

Soaps and Proteins, their Colloid Chemistry in Theory and Practice. By Martin H. Fischer. Pp. 272. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, 1291. Price 24s. net.

The first 200 pages of this work are devoted to a detailed description of the theory of soaps and its application to their manufacture. Thus it is chiefly of value to the technical chemist. It consists almost entirely of the author's own interesting work on the subject. One is surprised to find no reference to the recent important researches of MacBain. In the succeeding 45 pages, the facts are applied to the proteins and to tissues. Several statements are made that cannot be satisfactorily reconciled with other knowledge on the subjects in question, and can scarcely be accepted without the production of evidence, such, for example, as that there are no free salts in protoplasm, or that sugar solutions in isotonic concentrations do not prevent the taking up of water by cells. The book will doubtless be found useful by the soap chemist, and by those who desire an account of the author's work, but it is questionable whether to the physiologist it is worth the price charged for it.—W. M. B.

Œdema and Nephritis. By Martin H. Fischer. Third edition. Pp. 922. New York: John Wiley and Sons, 1921.

This volume, which is a well-arranged production, gives a clear exposition of the author's contention that protoplasm consists of hydrophile colloids, and that the movement of water in the organism depends on alterations in the capacity of the tissues for taking up water. Experiments are given showing the increased hydration capacity of colloids (gelatin, fibrin) by the action of acids, and upon this phenomenon is based the view that absorption of water from the large intestine is influenced by the presumed high CO_2 content of this blood; the blood colloids carry away the "imbibed" water. On reaching the lungs the loss of CO_2 causes this water to become "free," and it is this free water which is removed by the kidney.

Increase of acidity gives rise to increased hydration capacity, resulting in œdema and nephritis, and since the kidney is now not supplied with blood containing "free" water, it can abstract no water therefrom, and being itself acid also, its colloids do not part with water, and thus secretion stops.

The remedy is to remove the acidity with alkali (Na_2CO_3) and to lower the capacity for hydration of the body colloids by means of neutral salts (NaCl). Evidence is given of the success of this treatment in several clinical cases.

The author has fearlessly applied his underlying principle of the hydration capacity of the lyophile colloids to the explanation of several important physiological and pathological processes, where other laws of physical chemistry appear insufficient. In denying the existence of cell membranes and in ignoring osmotic and mechanical phenomena he has made the presentation of his own thesis much clearer, but at the same time rendered himself open to much criticism.—D. T. H.

OBITUARY NOTICES

GUSTAV MANN M.D. Edin. B.Sc. Oxon

Dr. G. Mann will be remembered by physiologists on both sides of the Atlantic. He was demonstrator of physiology at Oxford (1894-1908) and Professor at New Orleans (1908-16). On giving up physiology he became medical officer to several oil companies at Tampico, where he died from dysentery in July last at the age of 57. He leaves a widow and one son. He lost one son from malaria last year. We tender our sympathy to the survivors. He was the author of two books ("Physiological Histology," 1902, and " Chemistry of the Proteids," 1906) which attracted considerable notice at the time. The author of his obituary notice in the *Brit. Med. J.*, to whom I am indebted for these data, speaks of Mann as an eccentric genius. He is not far wrong.—W. D. H.

ALBERT S. F. LEYTON

Experimental medicine and physiology have suffered a sad and notable loss by the death at a comparatively early age of Albert Leyton, lately Professor of Pathology in the University of Leeds. It can be said truly that original enquiry in the field of those sciences was with him a life-passion. From his student days onwards, even into the latter days of his final illness, his interest and devotion to them never flagged. His discovery of the typhoid-agglutination test as a means toward recognition of enteric fever was an earnest of his power of achievement for the progress of medicine itself. But in the earlier years of his career he gave much of his time to physiology, both as a teacher and investigator. The writer of these lines had the privilege of collaborating with him in research on the reactions of the motor cortex of the brain, and remembers with admiration the patience and thoroughness which Leyton brought to that task. To know Leyton well was to appreciate the more, because to realise the more, his unswerving devotion to the advancement of medical knowledge, his pure integrity of purpose and ideal, and the innate kindness of his heart.—C. S. S.

PROFESSOR FRANÇOIS-FRANCK

The death of this distinguished French physiologist is announced in the *Morning Post* of September 13. He succeeded Marey at the Collège de France, and his work ran on much the same lines. He appears from his published work to have been mainly interested in the circulation and respiration, and his name is familiar through the various pieces of useful apparatus he devised.—W. D. H.

H. K. LEWIS & CO. LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

3194. The Laboratory of the Living Organism. M. O. Forster (Presidential Address, Section B, British Assoc.; *Nature*, 1921, **108**, 243-7).—The early portion of the address is a plea for the introduction into the general scheme of education of some system which would enable all persons of average intelligence to appreciate and understand "the wizardry by which living things contribute to their nourishment and to the æsthetic enjoyment of life." Organic chemistry, with its symbols for carbon, hydrogen, nitrogen, and oxygen, should take precedence of a proficiency in inorganic chemistry and the periodic law. The main portion of the address deals in an attractive manner with biochemistry as exemplified by the alkaloids, the nucleic acids, the relation between chlorophyll and hæmoglobin, anthocyans, the pigments of blossoms and fruits, the chemistry of the micro-organisms, and photosynthesis. The concluding remarks are a plea that the combative selfishness of individuals should be harnessed and directed against nature. "It is the nature motive, as distinct from the state motive or the world motive, which alone can salvage civilisation."—H. K.

3195. L'expérimentateur. M. Arthus (*Rev. suisse de méd.*, June 22, 1921, No. 25; reprint, pp. 6).—This thoughtful article is the preface to the author's forthcoming book ("De l'anaphylaxie et l'immunité," Masson et Cie, Paris). The spirit which should actuate research is outlined, and much of it is directed to beginners. "Gardez-vous des théoriciens," "Conservez votre originalité," are two of its many wise mottoes.—W. D. H.

3196. Die physikalischen Vorgänge bei der optischen Sensibilisation. F. Schanz (*Pflüger's Arch.*, 1921, **190**, 311-20).—Physical experiments on fluorescence.—C. L. E.

3197. Origine périphérique de l'hyperthermie provoquée par le bleu de méthylène. W. Koskowski and E. Maigre (*Compt. rend.*, 1921, **173**, 448-51; see Abstract No. 2708, Vol. VI., p. 390).—The effects of methylene blue are not upon the heat centres, because injections into the 4th ventricle produce no hyperthermia, and because administration of antipyrin or exclusion of the brain in various ways does not modify its action. Since the dye paralyses parasympathetic nerve endings, it is suggested that the effect is due to removal of vagus control of the liver, so that more glucose is set free into the circulation and burnt in the tissues. After excluding the liver from circulation, methylene blue caused no hyperthermia. Similarly, after curarisation, methylene blue caused no hyperthermia, so that probably the seat of the combustion of the glucose is in the muscles.—C. L. E.

3198. Biological Effects of the Tides. F. W. Flatteley (*Sci. Prog.*, 1921, **16**, 251-7).—A survey is put forward which justifies the view that the tides form an important factor, not only in moulding the present-day life of the seashore, but have had far-reaching consequences to life (plant and animal) in general. "This pulsing, ever-changing strip of the earth's surface has played a part in life out of all proportion to its size."—W. D. H.

3199. Symbiosis and the Biology of Food. H. Reinheimer (*Sci. Progr.*, 1921, **16**, 258-74).—A discursive but not uninteresting general article, dealing especially with theories.—W. D. H.

3200. The Stereotropism of the Dogfish (Mustelus californicus) and its Reversal through Change of Intensity of the Stimulus. S. S. Maxwell (*J. Gen. Physiol.*, 1921, **4,** 19-28).—The sense of the response to certain contact stimuli depends on the strength of the stimulus: if weak, the response is positive, or towards the stimulating object; if strong, it is negative. The point of reversal depends on the state of the animal. The reactions are present in the absence of the forebrain.—W. M. B.

3201. Chemical Stimulation of the Nerve Cord of Lumbricus terrestris. A. R. Moore (*J. Gen. Physiol.*, 1921, **4,** 29-31).—The results suggest that the nerve processes of the earthworm are similar in constitution to the axons of mammals, and that the neurons are more limited in response to chemical stimulation—*i.e.*, are simpler in constitution —than those of cephalopods and mammals.—W. M. B.

APPARATUS AND METHODS

3202. Étude critique des méthodes d'inscription du réflexe rotulien. E. Castex (*J. de physiol. et de pathol. gén.*, 1921, **19,** 332-47).—There seems to be no completely satisfactory method.—W. M. B.

3203. Mercury Manometer Float. M. A. Blankenhorn and E. J. Warnick (*J. Lab. and Clin. Med.*, 1921, **6,** 710).—This is made of hard rubber, and has a conical shape, so that it rids itself of any mercury which happens to get above it. The base is flat to ride on the surface of the mercury, and there is a projection from it with a small neck, which makes the mercury form a collar round it to hold it fast. An illustration is given.—D. H. de S.

3204. Un appareil pratique et précis pour mesurer la pression du sang. M. N. J. Dirken (*Arch. néerl. de physiol.*, 1921, **5,** 345-52).—Description of a portable clinical apparatus, for details of which see original.—C. L. E.

3205. Eine neue Methode zur Messung des Augendrucks. E. Stein (*Arch. f. Augenheilk.*, 1921, **87,** 197-209).—The method consists in noting the flattening produced by a known pressure acting on the cornea. Its advantage is that it will detect small differences in intra-ocular pressure in the two eyes.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3206. The Counting of Blood-Cells and Bacteria. G. Dreyer (*J. Amer. Med. Assoc.*, 1921, **77,** 1166-8).—Published elsewhere (Abstract No. 24, Vol. VI., p. 4).—C. L. E.

3207. Apparatus for Estimating Basal Metabolism. C. V. Bailey (*J. Lab. and Clin. Med.*, 1921, **6,** 657-79).—A detailed description is given, with numerous illustrations. The particular features are the use of the full-sized gas mask, the special arrangement of rubber flutter valves, a newly-designed gasometer, the use of a new type of gas sampling bottle, with several added mechanical features intended to lessen the labour of gas analyses.—D. H. de S.

3208. Nouveaux appareils d'analyse des gaz. M. N. J. Dirken (*Arch. néerl. de physiol.*, 1921, **5,** 353-62).—An apparatus for estimation of CO_2 and, with modifications, of O_2 is described and illustrated.—C. L. E.

3209. Zur Kritik von T. E. Hess-Thaysen betreffend die Bestimmung der unverseifbar Substanzen im tierischen Gewebe nach Kumagawa-Suto. T. Nagayama (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **22,** 373-410).—A defence of the latter method against Thaysen's criticisms. The non-saponifiable material is a mixture, and for a correct estimation of the cholesterol Windaus' digitonin method must be used.—W. D. H.

3210. Eine Mikromethode der Stickstoffbestimmung. D. Acél (*Biochem. Zeit.*, 1921, **121,** 120-4).—The ammonia formed is not distilled, but is determined colorimetrically by Nessler's reagent. The control is treated with standard ammonium chloride solution until the colours match.—H. K.

3211. Über die quantitative Bestimmung des Harnstoffes. Y. Funcke (*Zeit. physiol. Chem.*, 1921, **114**, 72-8).—Urea treated with Millon's reagent decomposes, giving 1 mol. NH_4NO_3, 1 mol. CO_2, 1 mol. N_2, 1 mol. H_2O. A method is described, based on this reaction, in which the nitrogen evolved is measured.—H. W. D.

3212. Estimation of Urea, Ammonia, and Amino-Acids in Urine after Precipitation of Ammonia. Philibert (*J. Pharm. chim.*, 1921, [vii.], **24**, 49-58).—Ammonia is precipitated as ammonium magnesium phosphate, and separated by filtration; the filtrate is then treated with basic lead acetate, again filtered, and the urea estimated by the hypobromite method. Another portion of the first filtrate is neutralised towards phenolphthalein, formaldehyde solution is added, and the mixture titrated with standard alkali solution.—W. D. H. (*J. C. Soc.*)

3213. Estimation of Non-Protein Nitrogen in Blood by a Micro-Kjeldhal Method. E. L. Kennaway (*Biochem. J.*, 1921, **15**, 510-2).—The principle of the method is that of the ordinary Kjeldhal. The main innovations appear to be the use of a metal bath (whose temperature is not given) for conducting part of the incineration process, and the introduction of the strong alkali by suction; 5 c.c. of serum suffice for 2 estimations. Time taken is 2 hours. Controls with ammonia and urea show a recovery of 98 to 99% nitrogen.—J. A. H.

3214. Amino-Nitrogen in the Urine by the Formol Method. C. Ciaccio (*Arch. sci. med.*, 1920, **43**, 177-81).—By a comparison of results by the Henriquez method and those obtained by a preliminary treatment of the sample with $Hg(OAc)_2$ or tannin and $Pb(OAc)_2$, figures being given both before and after hydrolysis with HCl, the conclusion is reached that the amino-N by the formol method in urine is not present in the form of simple amino-acids, but as more or less complex polypeptides. The discordant results obtained by various workers are thus explained, since polypeptides are partially precipitated by salts of heavy metals or by phosphotungstic acid. It is believed that the most useful information would be obtained by applying the formol method (1) after hydrolysis of the urine without any preliminary treatment; (2) after treatment with tannin and $Pb(OAc)_2$ or with $Hg(OAc)_2$; (3) after hydrolysis of the filtrate obtained by precipitation with these substances.—W. D. H. (*Chem. Abstr.*).

3215. Rapid Estimation of Sulphur in Urine. Ch. Rabaut and A. Stillmunkés (*Progrès méd.*, 1920, 50-1; *Rep. pharm.*, 1921, [3], **33**, 37-8).—Sulphur as preformed sulphate is estimated volumetrically by addition of a standard acidified solution of $BaCl_2$, the tube being centrifuged after each addition, until precipitation no longer takes place. Total sulphate is estimated in a like manner after boiling the urine with HCl, the total sulphur being similarly estimated in a clear solution of the incinerated urine.—W. D. H. (*J. C. Soc.*).

3216. Eine gravimetrische Bestimmungsmethode für kleine Phosphorsäuremengen. G. Embden (*Zeit. physiol. Chem.*, 1921, **113**, 138-45).—A micro-method for the estimation of phosphate is described, depending on precipitation as strychnine phospho-molybdate. The method is applicable with accuracy to quantities of P_2O_5 from 1 mg. upwards. —H. W. D. (*J. C. Soc.*).

3217. Estimation of Reducing Sugars in Organic Fluids. C. O. Guillaumin (*J. pharm. chim.*, 1920, **22**, 327-36, 378-90).—The author's method is a modification of Bertrand's, and is applicable to small quantities of fluid. He finds Folin and Wu's method sensitive, but the colour intensity increases more rapidly than the sugar content. It gives, with modifications suggested, accurate results when the amount of sugar is small, as in cerebro-spinal fluid.—W. D. H. (*Chem. Abstr.*).

3218. The Estimation of Sugar in Urine. J. C. v. d. Harst and C. H. Koers (*Pharm. Weekblad*, 1921, **58**, 1230-2).—The fermentation apparatus devised by Stephan under the name hydrosaccharometer has been found to be more trustworthy than Wagner's

apparatus, and to give results as accurate as those obtained by the polarimeter where the sugar content is not below 1%. The Causse-Bonnans method has been re-examined, and again found unsatisfactory.—W. D. H. (*J. C. Soc.*).

CHEMICAL

3219. Donnan Equilibrium and the Physical Properties of Proteins. IV. Viscosity—*cont.* J. Loeb (*J. Gen. Physiol.*, 1921, **4**, 73-95).—Further evidence that the influence of electrolytes on the viscosity of suspensions of powdered gelatin in water is similar to that in solutions of gelatin. The high viscosity of isoelectric gelatin is accounted for on the hypothesis that the relative volume in solution is high. This may be due to hydrated *ions*, but may be caused by the presence of sub-microscopic particles "occluding" water, the amount of which is regulated by the Donnan equilibrium. This idea is supported by the fact that the viscosity of solutions and suspensions of casein chloride is chiefly due to solid particles. The breaking up of these into smaller particles incapable of swelling diminishes the viscosity. Proteins form true solutions in water, sometimes containing solid particles taking up water. Their viscosity has therefore two sources: that due to molecules and ions (general viscosity) is of the low magnitude of that of crystalloids, and that due to the particles capable of swelling, which is high and may be called "special" viscosity. Under ordinary conditions the general viscosity prevails in egg-albumin and caseinates of univalent metals. The second type prevails in gelatin, in acid salts of casein, and in egg-albumin at P_H below 1 and at higher temperatures. The water occluded by gelatin is greater than that by casein, hence the special viscosity is higher in the former case.—W. M. B.

3220. The Reciprocal Relation between the Osmotic Pressure and the Viscosity of Gelatin Solutions. J. Loeb (*J. Gen. Physiol.*, 1921, **4**, 97-112).—The conclusion is confirmed that protein solutions consist of isolated ions and molecules, sometimes with particles capable of "occluding" water. The typical effect of electrolytes on the osmotic pressure of such solutions is due to the isolated protein ions, since these alone cause the Donnan equilibrium across a membrane impermeable to protein, but permeable to crystalloids. The similar influence on viscosity is due to the amount of water, regulated by the Donnan equilibrium, occluded by the solid particles. These views are supported by the fact that the more particles are converted into ions (*e.g.*, by keeping gelatin at 45° C.), the more the viscosity falls, while the osmotic pressure rises.—W. M. B.

3221. Comparative Hydrolysis of Gelatin by Pepsin, Trypsin, Acid, and Alkali. J. H. Northrop (*J. Gen. Physiol.*, 1921, **4**, 57-71).—The linkages easily split by pepsin or trypsin are more resistant to acid. Those attacked by pepsin are also attacked by trypsin, but the latter attacks some which are inaccessible to the former. Some linkages rapidly attacked by pepsin are only slowly attacked by trypsin. Alkali attacks first the same linkages as those accessible to the enzymes. Thus the early stages are similar in the cases of alkali and enzymes, different with acid.—W. M. B.

3222. Die Bedeutung der Quellung und Entquellung für einige Fragen der Biochemie. M. Richter-Quittner (*Biochem. Zeit.*, 1921, **121**, 273-92).—By means of the Zsigmondy-Haen ultra-filtration apparatus the author has examined the influence of electrolytes and non-electrolytes on the velocity of ultra-filtration of various dispersoid systems—*e.g.*, sera—for substances which inhibit imbibition will accelerate the filtration. All potassium salts, heavy metal salts, urea, and sugar inhibit, whilst other cations favour imbibition. For anions the Hofmeister series holds good.—H. K.

3223. Studies on Gelatin. I. The Dynamics of the Formation of Gelatin from Ossein. A. B. Manning and S. B. Schryver (*Biochem. J.*, 1921, **15**, 523-9).—The rate of extraction

at 90° and 100° of gelatin from various-sized pieces of bones is determined. It is concluded that, owing to the high porosity of bone, there is the same surface available whatever the size of the particles. In the extraction of gelatin the variation of rate with size of particles is not a true surface effect; the effect, is indeed, independent on the apparent surface (original surface + fissure surface). Except for very small particles, the rate of extraction is controlled largely by the rate at which gelatin diffuses out and water diffuses in through the pores. It is essentially a surface phenomenon.—J. A. H.

3224. Osmosis and Swelling of Gelatin. C. R. Smith (*J. Amer. Chem. Soc.*, 1921, **43,** 1350-66).—Swelling is due to the osmotic pressure within the jelly. From osmotic pressure its molecular weight is calculated to be 96,000.—W. D. H. (*J. C. Soc.*).

3225. Chemical and Physical Properties of Proteins. J. Loeb (*Chem. Met. Eng.*, 1921, **24,** 550-3).—The laws of classical chemistry account for both the chemical and physical behaviour of proteins, provided the H-ion concentration, which is the chief variable, is given due consideration. Much in relation to physical colloid chemistry of these substances is summarised.—W. D. H. (*Chem. Abstr.*).

3226. Physiological Oxidations. H. D. Dakin (*Physiol. Reviews*, 1921, **1,** 394-420).—A review of the literature on this subject from 1912 to date.—J. A. H.

3227. Partieller Austausch von Säuregruppen in der β-Penta-acetylglukose. P. Brigl (*Zeit. physiol. Chem.*, 1921, **116,** 1-52).—Tollen's pseudo-aldehyde formula for glucose, while highly probable, has not yet received strict chemical proof. The author attempted to throw light on the problem by acting on glucose with PCl_5 in the hope of substituting all the hydroxyl groups by chlorine, but the reaction did not proceed smoothly. He then tried the action of PCl_5 on β-penta-acetyl glucose, but again he failed to get the desired compound. He actually obtained a substance containing 4 Cl atoms, which proved to be 1-chloro-2-trichloracetyl-3, 5, 6-triacetyl glucose. The properties and reactions of this substance are the subject-matter of the paper.—H. W. D.

3228. Synthese von schwefel- und selenhaltigen Disacchariden durch Verkettung von zwei Glucoseresten in der C_6-Stellung. Über einige neue Derivate der 6-Bromglucose. F. Wrede (*Zeit. physiol. Chem.*, 1921, **115,** 284-304).—1, 6-dibromoglucose was converted into the acetate of methylglucoside-6-bromhydrin. By the action of potassium sulphide and reacetylation of the product the acetate of the dimethylglucoside of the desired disaccharide was obtained. From this substance, by alkaline hydrolysis, the glucoside itself was prepared, which, treated with dilute HCl, yielded the free disaccharide. Analogous reactions were carried out with potassium selenide and diselenide.—H. W. D.

3229. Über die Einwirkung von Aminosäuren auf Zuckerarten. L. Grünhut and J. Weber (*Biochem. Zeit.*, 1921, **121,** 109-19).—The interaction between various amino-acids and sugars with special reference to melanoidin formation has been followed by formol titration, optical activity, and reducing power. The reaction is in general complex, and varies from case to case.—H. K.

3230. Das optische Drehungsvermögen der Dextrose unter den Einfluss von Salzsäure —II. H. Murschhauser (*Biochem. Zeit.*, 1921, **116,** 171-90).—Entirely chemical.—H. K.

3231. Über Glucose- und Rohrzucker-monoschwefelsäure—III. C. Neuberg and L. Liebermann (*Biochem. Zeit.*, 1921, **121,** 326-32).—The preparation of a monosulphuric acid ester of glucose and of cane sugar is described.—H. K.

3232. Estimation of Phenylhydrazine Volumetrically, and its Application to the Estimation of Pentosans and Pentoses. A. R. Ling and D. R. Nanji (*Biochem. J.*, 1921, **15,** 466-8).—Phenylhydrazine with excess of iodine reacts thus: $C_6H_5NHNH_2+2I_2=3HI+C_6H_5I+N_2$. The excess of iodine is determined by titration with sodium thiosulphate. The original phenylhydrazine is thus calculated. The pentose or pentosan is distilled with acid, the distillate neutralised, made faintly acid with acetic acid,

treated with phenylhydrazine acetate, the hydrazone removed by filtration, and the phenylhydrazine estimated.—J. A. H.

3233. Iodide of Starch. A. Lottermoser (*Zeit. angew. Chem.*, 1921, **34,** 427-8).—Experiments support Biltz's conclusion that this is an adsorption compound.—W. D. H. (*J. C. Soc.*).

3234. Über die Bildung von d-Milchsäure im tierischen Organismus. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 1-11).—The *d*-lactic acid content is very small, and of the order 0·006% in egg-white and 0·01% in the yolk of hens' eggs. That in unfertilised eggs is less, and as incubation proceeds the lactic acid reaches its maximum on the 5th day, and is very small at the end of 14 days.—H. K.

3235. Über das Verhalten des im Eierklar sowie im Dotter vorhandenen Reststickstoffes bei Bebrütung von Hühnereiern. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 12-4).—After removal of all substances precipitable by boiling with dilute acetic acid and by tannic acid, the total residual N in the filtrate by Kjeldhal, the N in the fraction still precipitable by phospho-tungstic acid, and the amino-N in the final filtrate were estimated. Fresh eggs contain very little residual N or amino-N, but as incubation proceeds there is a steady increase of residual N up to 14 days.—H. K.

3236. Über den Einfluss der Zugabe von Traubenzucker und Alanin zum Weissei auf die Bildung der d-Milchsäure bei der Bebrütung. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 15-21).—Glucose and alanine were introduced aseptically into the white, and the egg was incubated for 3 days. Alanine had no marked effect on the lactic acid content of white or yolk, but glucose produced an increase in the lactic acid content somewhat less than 100%.—H. K.

3237. Über das Verhalten des bei der Bebrütung von Hühnereiern dem Eiweiss zugesetzten Traubenzuckers. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 22-7).—The normal content of glucose in eggs after 3 days' incubation is 0·43% in the white, and 0·2% in the yolk. Administration of glucose to the white of eggs followed by incubation for 3 days causes a marked disappearance of glucose from the egg-white, but not from the yolk. Glucose appears, therefore, to act as a source for the lactic acid found.—H. K.

3238. Über die chemische Zusammensetzung der Eischale des Seidenspinners. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 40-7).—The egg-shell of the silkworm moth is composed of protein, and not of chitin. On hydrolysis with acids and separation of the amino-acids by standard methods, 40% of the constituent amino-acids was isolated. Glycine, 13·7, and tyrosine, 11·2%, were present in the largest proportion.—H. K.

3239. Über die Bildung der Fleischmilchsäure im tierischen Organismus. Über die Bildung von d-Milchsäure bei der Autolyse des Hühnereies. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 28-39).—The lactic acid content of egg-white undergoing autolysis is independent of time, but that of the yolk increases considerably, and eventually falls off. If glucose is added to the yolk the lactic acid shows an enormous increase, whilst that of the white is unchanged. Alanine has no effect in either case. During autolysis an enzyme present in the yolk, but not in the white, has the power of converting glucose into lactic acid.—H. K.

3240. Oils from Reptiles and Amphibia. M. Tsujimoto and S. Kobayaschi (*J. Chem. Ind.*, Japan, 1920, **23,** 1099-1101). **Head Oil of Sperm Whale.** M. Tsujimoto (*Rep. Tokio Imp. Univ.*, 1920, **15,** 1-80). **Shark Liver Oils.** M. Tsujimoto (*ibid.*, 81-7).—Details of chemical analyses and physical constants. Titles (from *Chem. Abstr.*, 1921, **15,** 2005-6) are given for those interested.—W. D. H.

3241. Hydrieren von Ölsäure zu Stearinsäure. R. Feulgen (*Zeit. physiol. Chem.*, 1921, **114,** 1-3).—One gm. of oleic acid in 10 g. glacial acetic acid is quantitatively

reduced in 5 minutes by shaking with 0·1 g. Pt black in an atmosphere of hydrogen. —H. W. D. (*J. C. Soc.*).

3242. Undeka-methylen-dicarbonsäure als Abbauprodukt der Oleinsäure. I. Lifschütz (*Zeit. physiol. Chem.*, 1921, **114,** 28-30).—The so-called "oily acid" of wool fat is considered to be identical with a product obtained by the oxidation of oleic acid with $KMnO_4$. This substance, after purification, has similar properties to those of undecamethylene-dicarboxylic acid (Komppa, *Ber. deut. chem. Ges.*, **34**, 899).—H. W. D.

3243. Liver Lecithin. P. A. Levene and H. S. Simms (*J. Biol. Chem.*, 1921, **48,** 185-96).—The fatty acids of liver lecithin appear to consist of 2 saturated and 2 unsaturated acids. The saturated acids are palmitic and stearic; the unsaturated are an unsaturated stearic and an unsaturated arachidic acid, as shown by the products given on reduction. From molecular weight considerations it is shown that liver lecithin probably consists of a mixture of monolecithins. An improved method for preparing a pure lecithin from the cadmium chloride compound is described.—J. C. D.

3244. Structure and Significance of the Phosphatides. P. A. Levene (*Physiol. Reviews*, 1921, **1,** 327-93).—A review of the subject, with special reference to the work done since MacLean's monograph appeared. The subject, however, is treated generally under the following heads: (*a*) Preparation of phosphatides, (*b*) structure of individual phosphatides, (*c*) biological aspect of the phosphatides. The bibliography by I. P. Rolf is most exhaustive, and contains over 700 references.—J. A. H.

3245. Die Einwirkung von Benzoylperoxyd auf Cholesterin. A. Windaus and H. Lüders (*Zeit. physiol. Chem.*, 1921, **115,** 257-69).—The "metacholesterol" of Lifschütz (*Zeit. physiol. Chem.*, 1919, **106,** 271; and 1920, **111,** 254) is not an isomer of cholesterol, but merely ordinary cholesterol contaminated with small amounts of impurity, and the same applies to the "metacholesterol" prepared from cholesterol and benzoyl peroxide. The chief product of the latter reaction is not an oxidation product, but an addition compound with benzoic acid.—H. W. D.

3246. Die Chemie der Eiweisskörper und die physiologische Synthese der Polypeptide. J. Pohlmann (*Inaug.-Diss. Delft*, 1920, 166 pp.).—A monograph on the preparation and properties of amino-acids and polypeptides, and on their synthesis and mutual interactions in surviving organs.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3247. Über Eiweissderivate basischer Natur. K. Felix (*Zeit. physiol. Chem.*, 1921, **116,** 150-65).—Substances have been isolated from intestinal mucosa, lymph glands, and the thymus, which have the following characteristics: Strongly alkaline reaction, high content of hexone bases, non-precipitability by ammonia, potassium ferrocyanide, Witte peptone, and nucleic acid—thus differing from the histones—red-violet biuret reaction, and resistance to tryptic digestion.—H. W. D.

3248. Über die freien Aminogruppen der Eiweisskörper. R. Engeland (*Zeit. physiol. Chem.*, 1921, **116,** 226-7).—A criticism of the experiments of Edlbacher on the methylation of proteins (see Abstract No. 75, Vol. VI., p. 9). There are 2 main objections: (1) Secondary changes (*e.g.*, hydrolysis) may occur during methylation in alkaline solution; (2) it is unlikely that the amino-acids in peptide combination behave exactly as they do in the free state. **Bemerkung zu vorstehenden Notiz von R. Engeland.** S. Edlbacher (*ibid.*, p. 228).—A refusal to be drawn into further discussion.—H. W. D.

3249. Preparation and Analysis of Animal Nucleic Acid. P. A. Levene (*J. Biol. Chem.*, 1921, **48,** 177-83).—The preparation of nucleic acids from liver, pancreas, and spleen is described. All 3 acids gave adenine and guanine on hydrolysis, but no pentose. The amounts of purine bases obtained from the 3 nucleic acids varied, and it is doubtful if the 3 acids have the same structure.—T. A. W.

3250. Preparation and Recrystallisation of Oxyhæmoglobin. H. W. Dudley and C. L. Evans (*Biochem. J.*, 1921, **15,** 486-7).—Defibrinated horse blood is centrifuged, and the corpuscles washed with isotonic salt solution until the supernatant liquid remains clear on boiling. The corpuscle paste is dialysed in collodion tubes under the pressure of a column of mercury, first against running tap-water for 3 days, finally against frequent changes of distilled water for 2 days. The corpuscles are completely laked, and the hæmoglobin becomes in part reduced during this operation, a deep purple solution being obtained. This is centrifuged and poured off from the deposit of stromata, etc. Oxygen is next bubbled through the solution till crystallisation suddenly takes place after about 20 minutes. The pasty mass is centrifuged, the crystalline hæmoglobin settling to the bottom. This is *completely* soluble in water. It is recrystallised from 2 or 3 volumes of water by heating to 37°, and attaching the containing flask to a vacuum pump. The oxyhæmoglobin is reduced to hæmoglobin, and forms a deep purple solution. The solution is cooled and reoxygenated, when oxyhæmoglobin again crystallises out. This can be done repeatedly.—J. A. H.

3251. Ricerche chimico-fisiche sull' emoglobina con particolare riguardo alla dottrina dell' aggregazione molecolare. M. Camis. I. (*Hæmatologica*, 1921, **2,** 149-211), II. (*Arch. di Sc. Biol.*, 1921, **2,** 134-40).—I. The surface tension of dialysed solutions of hæmoglobin at a concentration between 0·4 and 19·2% is smaller than that of distilled water. Such tension diminishes as the temperature is raised from 10° C. upwards. It increases with the concentration of the Hb solution up to a certain limit, beyond which it diminishes. The surface (molecular) energy follows a similar curve; its maximum corresponds to a concentration of about 6%. For concentrations oscillating between 0·4 and 6% the curve is parabolic, probably due to phenomena of superficial absorption. The addition of 0·006 up to 0·1% of lactic acid to solutions of Hb or of laked blood diminishes their surface tension. This shows that a molecular aggregation has taken place. The addition of lactic acid to solutions of Hb or of hæmolysed blood diminishes their coefficient of luminous extinction, which indicates a diminution in the number of particles pierced by the light rays. The effect of the addition of lactic acid is more pronounced in solutions of Hb than in solutions of blood. In acidosis due to lactic acid the Hb molecules collect in larger groups than normal. II. The doctrine of the molecular concentration of Hb holds good also as regards the normal influence upon erythrocytes of electrolytes, which appear to cause an arrangement of the blood-pigment into small molecular groups. The influence of lactic acid is reversible.—C. d. F.

3252. Myoglobin. H. Günther (*Virchow's Arch.*, 1921, **230,** 146-78).—This name is given to the muscle pigment which appears, so far as one can judge, to be MacMunn's myohæmatin redivivus. It is not identical chemically, spectroscopically, etc., with hæmoglobin, but is regarded as a respiratory pigment, and is stated to undergo changes in CO poisoning, hæmoglobinuria, and various forms of anæmia.—W. D. H.

3253. Über die Trennung aliphatischer Amine von einander und von Ammoniak. H. Franzen and A. Schneider (*Biochem. Zeit.*, 1921, **116,** 195-207).—A method is described for the quantitative separation of ammonia and the methylamines. It depends on the fact that ammonium chloride and monomethylamine hydrochloride are insoluble in chloroform, and ammonia alone forms a compound with yellow mercuric oxide. Iodine in potassium iodide separates di- and trimethylamine by forming a periodide with trimethylamine.—H. K.

3254. Colorimetrische Untersuchungen über das Tryptophan—IV. and V. O. Fürth and F. Lieben (*Biochem. Zeit.*, 1921, **116,** 224-31, 232-6).—IV. By investigating the tryptophane content of various proteins colorimetrically and determining the amount of melanoidin formed on acid hydrolysis, a parallelism is observed between the tryptophane content and the melanoidin formed. The authors consider that the melanoidins

are the condensation products of tryptophane molecules. The term humin is reserved for the results of change of carbohydrate complexes. V. Sera from horses immunised against diphtheria, dysentery, and tetanus showed an increased content of protein due to an increase in the pseudo-globulin fraction. The content of tryptophane in each fraction was, however, normal.—H. K.

3255. Die Bedeutung der zweiten Dissoziationskonstante der Harnsäure für die Gleichgewichte der Monouratlösungen. A. Kanitz (*Zeit. physiol. Chem.*, 1921, **116,** 96-106).—The salts of uric acid with one equivalent of a strong monovalent base dissociate to give the normal salt (diurate) and free uric acid in accordance with the formula: $\frac{\text{Monourate}^2}{\text{Diurate} \times \text{free uric acid}} = \frac{k_1}{k_2}$, where k_1 and k_2 are the first and second dissociation constants of uric acid. From the value of k_2 it follows that the hydrolytic decomposition of diurates into monourates and hydroxyl ions must be much less significant than has been commonly assumed.—H. W. D.

3256. Bile Acids. W. Borsche, H. Behr, and H. Wieckhorst (*Nachr. Ges. Wiss. Gottingen*, 1920, 188-94).—Purely chemical data regarding several complex derivatives of bile acids.—W. D. H. (*J. C. Soc.*).

3257. Contribution à l'étude spectrophotographique des pigments du bacille pyocyanique (spectres dans l'ultra-violet). J. Cluzet, A. Rochaix, and T. Kofman (*J. de physiol. et de pathol. gén.*, 1921, **19,** 378-82).—Pyocyanin and the green fluorescent pigment give definite bands in the ultra-violet. The other two pigments totally absorb these rays.—W. M. B.

3258. A propos de la detection microchimique des carbures injectés dans les tissus. E. Fauré-Fremiet (*Compt. rend. soc. biol.*, 1921, **85,** 638-9).—A method for detecting in dried or altered pus, paraffins, benzene, or the essential oils. The tissue is treated at room temperature with hydrated sodium ethylate. This saponifies the fats, and the compounds sought for remain insoluble.—J. H. B.

3259. Beitrag zur Praxis der Bleifällung. H. Langecker (*Biochem. Zeit.*, 1921, **122,** 34-8).—Entirely chemical.—H. K.

3260. Bestimmung von Chlor, Kalzium, Magnesium, und Phosphosäure in der Milch. Siegfried's Nucleon. Y. Takeno (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **22,** 411-42).—This deals with modifications of various analytical methods. Nucleon is a mixture of which the chief constituent is denatured protein.—W. D. H.

ENZYMES

3261. Enzymes. M. Mühlmann (*Virchow's Arch.*, 1921, **230,** 448-60).—Life involves the constant action of enzymes. All serum contains specific enzymes capable of digesting various organs; they are not "protective," but physiological.—W. D. H.

3262. Über Fermente. I. Über die Gewebsproteasen. S. Nagagawa (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **25,** 67-119).—Autolysis in liver, spleen, and kidney of rabbit, ox, and guinea-pig goes best in a weakly acid medium (P_H =4 to 5); digestive action on cooked organ protein is greatest at the same P_H. Organ enzymes differ, peptases acting best in weak alkaline solutions. But this new enzyme differs from what the author terms pepsinases and tryptase, and resembles the phytoproteases. This is the main outcome of the research, to which a deal of theoretical matter is added.—W. D. H.

3263. Über Vergiftung der Amylase durch Schwermetalle und organische Stoffe. U. Olsson (*Zeit. physiol. Chem.*, 1921, **114,** 51-71).—Silver nitrate, chloride and cyanide,

copper sulphate, iodine, aniline, and phenylhydrazine all exert a toxic effect on amylase. The silver salts are most toxic, and aniline the least. With constant amounts of enzymes the effect is proportional to the amount of poison; with constant amounts of poison the effect increases with diminishing amounts of enzyme.—H. W. D. (*J. C. Soc.*).

3264. Über die Elution von Saccharase und Maltase aus ihren Adsorbaten. R. Willstätter and R. Kuhn (*Zeit. physiol. Chem.*, 1921, **116,** 53-66).—The stability of adsorption compounds of the above enzymes is largely dependent on the nature of accompanying impurities, some of which hinder, while others assist, the re-solution of the enzymes. The conditions are very complex; for instance, cane sugar removes only slowly and incompletly invertin which has been adsorbed on alumina, but the addition of a little NaH_2PO_4 results in complete recovery of the enzyme in a few minutes. This is a specific action of neither the sodium phosphate nor of the H-ion concentration, since the phosphate can be replaced without altering the result by a citrate buffer solution of P_H=4·5, while an acetate buffer solution of the same P_H has no effect.—H. W. D.

3265. Carboligase—II. C. Neuberg and L. Liebermann (*Biochem. Zeit.*, 1921, **121,** 311-25).—*o*-Chlorobenzaldehyde and anisaldehyde behave exactly like benzaldehyde (*Biochem. Zeit.*, 1921, **115,** 282), yielding benzoin-like products of the formula $R.C_6H_4.CHOH.CO.CH_3$.—H. K.

3266. Über die Succinodehydrogenase. E. M. P. Widmark (*Skand. Arch. Physiol.*, 1921, **41,** 200-20).—As enzyme solution an extract was used, prepared by extracting, with 1·5%Na_2CO_3, ground horse or ox muscle previously washed thoroughly with water. The time of complete decolorisation of a given quantity of methylene blue by the extract in presence of potassium succinate was inversely proportional to the concentration of enzyme solution. The law of enzyme action, therefore, applies to this reaction.—H. H. D.

3267. Über die Blutkatalase bei Blutkrankheiten. H. Strauss and G. Rammelt (*Biochem. Zeit.*, 1921, **122,** 137-43).—The catalase index is approximately constant in normal corpuscles and in secondary anæmia. In pernicious anæmia the index may reach double its normal value.—H. K.

3268. Einfluss der Reaktion auf die Wirkung des Trypsins—I. W. E. Ringer (*Zeit. physiol. Chem.*, 1921, **116,** 107-28).—The action of trypsin on fibrin at various H-ion concentrations was studied. The more alkaline the reaction the more vigorous is the digestion until this is offset by the instability of trypsin in alkaline solutions. Trypsin is stable at P_H=3·15, but at greater acidities is inactivated, while at P_H=12 it is almost instantly destroyed. The protective action of protein on trypsin is ascribed simply to its power of combining with alkali.—H. W. D.

3269. Digestion of Fibrin and Caseinogen by Trypsin. E. S. Edie (*Biochem. J.*, 1921, **15,** 498-506).—The amount of acid required to protect trypsin from destruction by heat depends on the amount of protein present. The power to digest caseinogen is less affected by heat than the power to digest fibrin. The relative amounts of fibrin and caseinogen digested vary very much in different pancreatic extracts. The milk coagulating power of pancreatic extracts is more easily destroyed by heat than the proteoclastic power. Generally, but not always, freshly prepared pancreatic extracts have no milk coagulating power, but are always actively proteoclastic. The coagulating and proteoclastic properties of pancreatic extracts are due to different enzymes or to different groups of the molecule.—J. A. H.

3270. The Question of the Identity of Gastric Rennin and Pepsin. E. S. Edie (*Biochem. J.*, 1921, **15,** 507-9).—In rabbits, the stomachs of the young contain rennin, but no pepsin; those of adults pepsin, but no rennin. The enzymes are therefore different.—J. A. H.

PHYSIOLOGY OF INVERTEBRATES

3271. Reactions of Vorticella nebulifera. F. Danisch (*Z. allgem. Physiol.*, 1921, **19,** 133-90).—An exposition of experimental data upon the reactions of *Vorticella* when subjected to mechanical, thermal, electrical, and chemical stimuli.—W. D. H. (*Chem. Abstr.*).

3272. Elimination of the X-Chromosome from the Egg of Drosophila melanogaster by X-Rays. J. W. Mavor (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 301-2).—Experiments on crossing red-eyed females with white-eyed males show that X-rays, by affecting the X-chromosome, can disturb the inheritance of a sex-linked character.—D. H. de S.

3273. The Survival Value of Conjugation in the Life History of Spathidium spathula. L. L. Woodruff and H. Spencer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 303-4).—The data obtained indicate that in a particular pedigree culture, under the conditions of the experiment, the survival value of conjugation in the majority of cases is marked, the exconjugant lines exhibiting a higher division rate and outliving the non-conjugant lines.—D. H. de S.

3274. Organisation of the Starfish Egg. R. Chambers (*J. Gen. Physiol.*, 1921, **4,** 41-4).—That part of the starfish egg chiefly concerned in development lies in its periphery. The interior, when separated, is incapable of developing, while if cortical material alone is present, the egg carries on its usual activities.—W. M. B.

3275. The Action of Neutral Isotonic Salt Solutions in Sensitising Arbacia Eggs to the Activating Influence of Hypertonic Sea-Water. R. S. Lillie and Margaret L. Baskervill (*Amer. J. Physiol.*, 1921, **57,** 110-24).—Sodium salts at 20° to 22° for 5 to 10 minutes have the above action. It may be decreased, but not prevented, by the presence of Ca. The sensitised eggs show no other alteration. They do not form fertilisation membranes, and may remain fertilisable for 24 hours or more.—W. M. B.

3276. Gradients of Vital Staining and Susceptibility in Planaria and Other Forms. J. W. MacArthur (*Amer. J. Physiol.*, 1921, **57,** 350-86).—In paramœcium, hydra, flatworms, and oligochætes, a staining and disintegration gradient, sometimes a decolorisation gradient, could be shown with dyes, especially methylene blue. Places of highest susceptibility are the first to stain and the first to disintegrate. The differences in metabolic activity appear to be associated with differences in permeability.—W. M. B.

3277. Intracellular Respiration. V. Action of KCN. E. J. Lund (*Amer. J. Physiol.*, 1921, **57,** 336-49).—Potassium cyanide, even in cytolytic doses, does not decrease respiration in paramœcium, whether the solutions are neutralised or not. The decrease of respiration found in planaria is the same in amount in fed and in starved animals. —W. M. B.

3278. Mikroskopische Beobachtungen der phototropen Pigmentwanderung im lebenden Libellenocell. C. v. Hess (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 277-80).—The wandering of the pigment under the influence of the light was observed for the first time by the microscope in all the different phases. The pigment was protruded vertically to the direction of the light rays.—H. W.

3279. Über die Extraktstoffe von Melolontha vulgaris—II. D. Ackermann (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 319-21).—The arthropod metabolism (like that of the crustacea) leads to a piling up of arginine, but creatinine and methyl guanidine are absent.—H. W.

3280. The Blood of Ascidia atra. J. F. Fulton, jun. (Contrib. from *Bermuda biol. stat.*, 1920, No. 125; *Acta Zool.*, Arg. 1, Häft 3; reprint, pp. 51).—This blood contains 10 types of corpuscles, 3 of which are pigmented. The 7 others are in 2 groups, one

capable of independent movement, the other not. The plasma sulphate increases after death. Vanadium is absent. Coagulation consists of simple agglutination of the pigmented cells, and then true coagulation follows, due to cytolysis of hyaline amœbocytes. There are no thigmocytes, and blood-parasitism is rare. The pigmented cells are green (passing to orange), blue, and brown. They arise from unpigmented cells. The acid of the blood is in the green cells. Blue do not arise from green cells; the formation of a green cell is a change from sol to gel. Other details added are believed to show that the groups are genetically distinct; colour changes due to acid and alkaline reagents also occur. Phagocytosis is accelerated by warmth, by small amounts of Ca, and by an opsonin in the plasma. The test or tunic excretes waste products of the blood, particularly degenerated blood-corpuscles, especially blue ones. As the cells become granular, their phagocytosis lessens. The permeability of the cells to acid, NH_3, stains, etc., is described.—W. D. H.

CELLS AND TISSUES

3281. Azione dei raggi ultravioletti sulla fagocitosi batterica. A. Azzi (*Hæmatologica*, 1920, **1**, 435-40).—Staphylococci exposed for a brief time to the action of ultraviolet rays are more easily and more rapidly destroyed by human polymorphocytes than the same germs when untreated. The action of the same rays on both blood and bacteria may favour the phagocytosis still further. However, this action is subordinated to the length of the exposure, intensity of the rays, and thickness of the irradiated material.—C. d. F.

3282. L'influenza della narcosi eterea sulla fagocitosi. L. Torraca (*Hæmatologica*, 1920, **1**, 454-64).—General anæsthesia with ether has an immediate influence on phagocytosis. Clinical observations and experiments *in vitro* show that small doses of the anæsthetic increase the phagocytosis, while large ones diminish or prevent it. These phenomena are probably due to a direct influence of the ether upon the phagocytes. —C. d. F.

3283. The Influence of Colloidal Gold on Phagocytosis. T. Nishida (*Nippon Biseibutsugakkwai Xasshi* [*J. Jap. Microbiol. Soc.*], 1921, **15**, No. 5).—The action is inhibitory.—J. A. H. (*Jap. Med. World*).

3284. Sur le phénomène d'accolement des microbes aux leucocytes. M. le Fèvre de Arric (*Compt. rend. soc. belge de biol.*, 1921, 672, 673, 675-6).—(1) En utilisant des leucocytes de cobayes, paralysés par la conservation à 0° pendant deux à trois jours, et des microbes divers, sensibilisés par un immun-sérum chauffé, on peut observer directement à l'ultramicroscope le phénomène d'accolement des microbes au protoplasme leucocytaire, cellules entières ou débris de leucocytes. (2) L'affinité de contact du microbe pour le leucocyte est considérablement accrue par la sensibilisation (sérum spécifique ou normal suivant les espèces). L'adhésivité, dans la même espèce, paraît en rapport avec la virulence. Les moyens de tuer les microbes ne sont pas indifférents dans la modification physico-chimique qu'ils leur impriment (chauffage, formolage). (3) Il est possible de préparer des extraits de leucocytes contenant des substances adhésives, absorbables par le noir animal. On peut observer au niveau de grains de noir animal, préparés par ces extraits, le phénomène d'accolement des microbes, surtout si ces derniers ont été préalablement sensibilisés.—E. Z.

3285. Wandering Cells, Endothelial Cells, and Fibroblasts in Cultures from Human Lymph Nodes. W. H. Lewis and L. T. Webster (*J. Exp. Med.*, 1921, **34**, 397-405).—Actively amœboid and phagocytic wandering cells migrate from the cultures after 2 to 3 hours; less active endothelial cells appear after 24 to 48 hours; and fibroblasts

after 48 hours (inactive). The probable origin of wandering cells from endothelial cells is discussed.—C. L. E.

3286. Measurements of the Growth of Tissues in Vitro. A. H. Ebeling (*J. Exp. Med.*, 1921, **34,** 231-43).—A uniform technique has been developed, by following which two fragments of tissue under identical conditions grow at practically the same rate, as measured by a method described.—C. L. E.

3287. The Multiplication of Fibroblasts in Vitro. A. Carrel and A. H. Ebeling (*J. Exp. Med.*, 1921, **34,** 317-37).—The temporary multiplication of fibroblasts cultivated in adult plasma is due to the presence of small amounts of embryonic juice within the tissue itself; the same applies to the indefinite multiplication of fibroblasts in a medium composed of adult plasma and embryonic juice. There is a definite relation between rate of growth and concentration of embryonic juice in the medium.—C. L. E.

3288. Zur Frage der Protoplasma-activierung. A. Frisch and W. Starlinger (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 142-58).—The changes known as protoplasma activation, in so far as these can be judged from the chief properties of the blood, can be effected by specific and non-specific proteins, X rays, and diathermy. The cells, the resistance of which is already low, respond by being destroyed, and younger cells are regenerated to take their place, causing an improvement of the whole body.—H. W.

3289. Amœboid Movement, Tissue Formation, and Consistency of Protoplasm. L. Loeb (*Science*, 1921, **53,** 261-2).—A continuation of previous work "showed that in the blood-cells of Limulus it is possible to produce graded variations in the character of the pseudopodia and amœboid movements through graded changes in the osmotic pressure of the surrounding medium." Greatly increased fluidity of the protoplasm was produced by the use of a slightly hypotonic KCl. Here the change in consistency was so marked that it affected not only the ectoplasmic layer, but extended to the whole. The remarkable resulting movements of the whole cell which followed take place only at a temperature sufficiently high. They do not occur at 10°. Blood-cells exposed to a temperature of 40-42° for a short period show in their periphery the appearance of multiple drops into which the granuloplasm moves subsequently as it does into typical pseudopodia. Through changes in the consistency of the protoplasm in the blood-cells of Limulus it is possible to imitate structures corresponding to different tissues such as those composed of ganglia and glia cells.—W. D. H. (*Chem. Abstr.*).

3290. Über die Umladbarkeit von Zellen, Zellbestandteilen und Membranen. K. Heesch (*Pflüger's Arch.*, 1921, **190,** 198-211).—Cataphoresis experiments showed that particulate negatively charged colloidal cell constituents, starch, cellulose, agar, gum, lecithin, cholesterol, and oil suffered discharge or reversal of charge by La salts, gum and agar by *m*/10, the others by *m*/100 to *m*/500. Yeast cells and lycopodium spores were also discharged by about *m*/500 La, whereas red and white blood-cells, if previously well washed, were only discharged by *m*/10. Histone or clupeine sulphate or salts of colour bases, like neutral red, Rhodamine S, and methyl violet, can also effect the discharge, but alkaloid salts are inactive. The efficiency of the La ions can be increased or diminished by the presence in the suspending fluid of other substances, such as albumin or gelatin (increase), or gum or agar (diminish). Electro-osmotic experiments on membranes (pig's bladder, muscle, parchment paper, agar membranes) also show that the membranes can be discharged by similar means.—C. L. E.

3291. Some Oxidation Mechanisms of the Cell. F. G. Hopkins (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 321-8).—An account of hydrolytic oxidation reductions, forming Lecture I. of the Herter Series, 1921.—C. L. E.

3292. Copper in Tissues. C. P. White (*Lancet*, 1921, ii, 701-3).—Analytical methods are fully given. Copper was found in all tissues examined (animal and plant). Analyses are given in a table. This and the known catalytic action of Cu suggests it may

have physiological significance. The amount increases in degenerating tumours.—W. D. H.

3293. On Inflammation. I. The Influence of Chemicals upon the Chemotaxis of Leucocytes in Vitro. Elizabeth P. Wolf (*J. Exp. Med.*, 1921, **34,** 375-96).—C. L. E.

3294. Cicatrisation of Wounds. XI. Latent Period. A. Carrel and P. L. du Noüy (*J. Exp. Med.*, 1921, **34,** 339-48).—The latent period of 5 to 7 days ceases suddenly, when contraction starts with its maximum velocity. The formula of du Noüy applies to all periods of contraction.—C. L. E.

3295. Kalkbindung durch tierische Gewebe—IV. and V. E. Freudenberg and P. György (*Biochem. Zeit.*, 1921, **121,** 131-41, 142-9).—IV. Natural cartilage, rich in Na, swells better than cartilage artificially enriched with Ca or Mg. In all 3 cases there is a minimum of swelling at P_H 4·7, the isoelectric point of the cartilage protein. V. Ca is only taken up by cartilage at concentrations above 0·01 N. Tryptic and autolytic processes, urea, and ammonium chloride inhibit its fixation.—H. K.

3296. Über den Einfluss von Schwefelinjektionen auf den Gelenkknorpel. R. Meyer-Bisch and W. Heubner (*Biochem. Zeit.*, 1921, **122,** 128-36).—Experiments on dogs seem to point to a diminution of the sulphur content and a diminished capacity for swelling of cartilage after injection of sulphur.—H. K.

3297. Su un particolare reperto nei leucociti eosinofili del cane. D. Zibordi (*Hæmatologica*, 1920, **1,** 451-3).—In the bone marrow, spleen, and circulating blood of dogs affected by *Tænia cucumerina* leucocytes were found provided with uncommonly large eosinophile granules. This finding has a certain importance, as it might, if confirmed, support the view that eosinophile granules originate from ingested particles of fragmented red blood-corpuscles.—C. d. F.

3298. Dynamics of Histogenesis. VII. The Transformation of the Smooth Bladder Muscle of the Dog into Cross-Striated Muscle. E. J. Carey (*Amer. J. Anat.*, 1921, **29,** No. 3).—The difference between smooth and cardiac muscle is dependent upon the intensity of the hydrodynamic pressure to which the vesicular and cardiac mesenchymal cells have been subjected. By varying the intensity of the intravesicular pressure for 8 weeks to that found in the heart, the non-striated bladder muscle is transformed histologically into cross-striated muscle and physiologically into an organ manifesting rythmicality as long as the hydrodynamic pressure stimulus is applied. The difference physiologically between various muscles is their capacity for work, which in turn is dependent upon the amount of work that has been expended in their production. The different degrees of energy possessed by muscles is purely an embryological biomechanical problem. The evidence warrants the conclusion that, as regards cross-striated muscle, function determines structure, and not the reverse.—W. D. H. (*W. I.*).

3299. Über abweichende Kern- und Zellteilungsvorgänge. II. Über die Entstehung der Riesenzellen im Knochenmark und der fötalen Leber bei Säugetieren. F. Levy (*Zeit. f. d. ges. Anat. I. Abteilung; Zeit. f. Anatomie und Entwicklungsgeschichte*, **61,** 32-40).—Histological investigations, with figures.—H. W.

3300. Über den Übergang des elastischen in den muskulösen Typus in der arteriellen Gefässwanden. H. Aihara (*Mitt. a. d. med. Fak. Univ.*, Tokio, 1919, **23,** 93-9).—A microscopical and macroscopical study of various arteries (? human) in relation to the distribution of elastic and muscular tissue in their walls.—W. D. H.

3301. Über die mechanisch wirkenden Papillen der Kaninchenzunge. H. Krieg (*Zeit. f. d. ges. Anat. I. Abteilung; Zeit. f. Anat. und Entwicklungsgeschichte*, 1921, **61,** 76-113).—Histological investigation. The development, structure, and cell regeneration of the rabbit's tongue are considered.—H. W.

3302. Die lokale galvanische Reaktion der Haut. U. Ebbecke (*Pflüger's Arch.*, 1921, **190,** 230-69).—The conductivity of the skin to galvanic currents (but not to alter-

nating currents) is lowered by mechanical, chemical, or other (including electrical) stimuli. The effect is considered to be an aspect of the cellular stimulation previously studied by the author in connection with local vaso-motor reactions (Abstract No. 2510, Vol. II., p. 602), and is not explained by moistening, by electrolysis, or electro-endosmosis, or by vaso-dilatation; it is of the same nature as the change in the psycho-galvanic and neuro-galvanic responses—namely, a reversible reduction of the polarisability and of the impermeability of cell membranes. But, unlike them, its cause is not nervous, but represents a local reaction of the epidermal cells, obtainable even for some days post-mortem. The type of excitation resembles that in plain muscle; it sets in at once with a latent period of 2 seconds, and is of long duration.—C. L. E.

3303. Die treibenden Kräfte für den Flussigkeitsstrom im Organismus. I. Osmotische Wirkungen und Quellungsdruck der Eiweisskörper. A. Ellinger and P. Heymann (*Arch. exp. Path. Pharm.*, 1921, **90,** 336-92).—The hind-limbs of a frog are perfused with fluids of different concentration and composition. The amount of fluid taken up or withdrawn from the tissues is observed. The conclusion is finally drawn that the "Quellungsdruck" of protein plays an extremely important part in determining the direction of the flow of liquid and salts in the blood-tissue exchange.—J. H. B.

MUSCLE

3304. Neuromuscular Transmission. I. The Action of Novocaine on Muscle Nuclei. J. F. Fulton, jun. (*Amer. J. Physiol.*, 1921, **57,** 153-70).—Novocaine may be linked by diazotisation with a number of bases, the compounds having the same physiological action as novocaine itself. The staining substance obtained by linking with meta-phenylendiamine was found most useful. It may be used either as such or be formed in the tissue *in situ* by treating in turn with novocaine, dilute nitrous acid, and meta-phenylendiamine. It stains nuclei only, neither nerve fibres nor cytoplasm of end plates. Its action on muscle is on the "receptive substance," like curare. Since "intravital" diazotisation shows it to be localised in the nuclei, it is concluded that the "receptive substance" in question is in the nuclei. There seems some doubt, however, whether the staining of the nuclei did not occur after death. On the other hand, it was found that if the tissue was treated first with meta-phenylendiamine, merely diffuse staining resulted, since the nuclei had not had the opportunity to take up the novocaine. But this latter fact seems difficult to reconcile with the statement that the dye already prepared stains the nuclei only.—W. M. B.

3305. Über die Chemie des Lactacidogens—III. G. Embden and F. Laquer (*Zeit. physiol. Chem.*, 1921, **113,** 1-9).—In support of the view expressed in 1914 (*ibid.*, **93,** 1) that the lactic acid in muscle originates from a hexose-phosphoric acid complex, the authors reported the isolation of an osazone which was identical with that previously obtained by Lebedev and by Young from yeast hexose-diphosphoric acid. They now give complete details of the isolation of the osazone. The authors do not claim to have established the identity of "lactacidogen" (the substance in striped muscle which gives rise to lactic acid) with the yeast hexose-diphosphoric acid, but they regard the osazone as a derivative of lactacidogen.—H. W. D. (*J. C. Soc.*).

3306. Über den Einfluss der Muskelarbeit auf den Lactacidogengehalt der quergestreiften Muskulature. G. Embden, E. Schmitz, and P. Meincke (*Zeit. physiol. Chem.*, 1921, **113,** 10-66).—Owing to the rapidity of the breakdown of lactacidogen in finely divided muscle at body temperature, estimations of inorganic P in fresh muscle and in the same muscle after remaining for 1 or 2 hours at 40° C. give indications of the amount of lactacidogen originally present. Diet and moderate doses of phloridzin have no effect on

the lactacidogen content. In rabbits severe muscular work following the administration of phloridzin, and in rabbits and dogs strychnine convulsions, cause a marked diminution of lactacidogen. The increase of lactic acid in experiments on the intact animal is proportionally not so great as that of P_2O_5, whereas on tetanising a frog's isolated muscle an increase in lactic acid is observed, with no increase in P_2O_5. This is explained by the effect of the different experimental conditions on the relative velocities of the decomposition of lactacidogen and its resynthesis from P_2O_5 and carbohydrates. Former estimations of inorganic P in muscle must have given results which were too high, owing to the rapidity of the breakdown of lactacidogen.—H. W. D. (*J. C. Soc.*).

3307. Über Steigerung der Leistungsfähigkeit durch Phosphatzufuhr. G. Embden, E. Grafe, and E. Schmitz (*Zeit. physiol. Chem.*, 1921, **113,** 67-107).—Experiments on soldiers and miners show that administration of 7·5 g. NaH_2PO_4 per day increases the capacity for muscular work, presumably by facilitating the resynthesis of lactacidogen. A favourable effect on the nervous system is also claimed.—H. W. D. (*J. C. Soc.*).

3308. Über den Einfluss der Muskelarbeit auf die Phosphorsäureausscheidung. G. Embden and E. Grafe (*Zeit. physiol. Chem.*, 1921, **113,** 108-37).—A few hours' hard work with an ergostat considerably increased the urinary phosphate in 2 trained individuals. The contradictory results of earlier observers are attributed to their not having been in training. Apparently in hard work the muscles take up, not only more sugar, but also more phosphoric acid from the blood.—H. W. D. (*J. C. Soc.*).

3309. Über den Lactacidogengehalt des Froschmuskels. A. C. Wechselmann (*Zeit. physiol. Chem.*, 1921, **113,** 146-73). **Einfluss der Aussentemperatur auf den Lactacidogengehalt des Frosches—I. and II.** E. Adler (*ibid.*, 174-86), E. Adler and L. Günzburg (*ibid.*, 187-92). **Über den Einfluss der Jahreszeit auf den Lactacidogengehalt des Froschmuskels.** E. Adler (*ibid.*, 193-200). **Über die Phosphorsäureverteilung in der weissen und roten Muskulatur des Kaninchens.** G. Embden and E. Adler (*ibid.*, 201-22). **Über den Lactacidogenphosphorsäure- und Restphosphorsäuregehalt von Hühner- und Taubenmuskeln.** G. Lyding (*ibid.*, 223-44). **Über die Phosphorverteilung in der Schenkelmuskulatur der Kröte.** P. Panajotakos (*ibid.*, 245-52). **Über den Einfluss der Muskelarbeit auf den Lactacidogengehalt in der roten und weissen Muskulatur des Kaninchens.** F. Cohn (*ibid.*, 253-62). **Über den Einfluss der Phosphorvergiftung auf den Lactacidogengehalt des Kaninchenmuskels.** G. Embden and S. Isaac (*ibid.*, 263-70). **Über den Einfluss der Phosphorvergiftung auf der Lactacidogengehalt des Froschmuskels.** E. Adler and S. Isaac (*ibid.*, 271-80). **Über den Einfluss des Fiebers auf den Phosphorsäurehaushalt des Muskels.** A. Adam (*ibid.*, 281-300). **Über den Mechanismus der Beeinflussung des Lactacidogengehalts von Froschmuskeln durch wechselnde Aussentemperatur.** H. Lawaczeck (*ibid.*, 301-12).—These twelve papers all support the contention that where muscular activity is greatest there is most lactacidogen. In cold-blooded animals (frog) there is more at 30° C. than at 0° C., and the mechanism of the change is not nervous, as it occurs in muscles with the nerve supply cut. When, with rise of temperature, the lactacidogen increases, the residual P diminishes. On cooling summer frogs, the reverse changes occur. The seasonal changes are correlated with muscular activity. The white muscles of rabbits contain about twice as much lactacidogen as the less active red muscles, which, however, are richer in non-lactacidogen P. The breast muscles of the pigeon have a greater reserve of residual P than those of the fowl. The toad has a greater content than the frog, since it does more work. Muscular work and strychnine convulsions decrease the lactacidogen in the white muscles of the rabbit, but not in the red, where, owing to slower action, time is given for its resynthesis. Phosphorus poisoning (accompanied by great muscular weakness) and Nagana fever have a similar effect.—H. W. D. (*J. C. Soc.*).

3310. Beeinflussen subminimale Reize den Ablauf chemischer Umsetzungen im isolierten Muskel? J. K. Parnas and E. Laska-Mintz (*Biochem. Zeit.*, 1921, **116,** 59-70).—Heidenhain and Gottschlich (*Pflüger's Arch.*, 1894, **56,** 355) found that subminimal stimulation of muscle for an hour resulted in increased production of lactic acid, although there was considerable variation in the results. In view of modern developments the authors reinvestigated the question, especially as the "all or nothing principle" seemed inconsistent with the above results. The lactic acid was estimated by Parnas' modification of the method of von Fürth and Charnass (*Zentralbl. f. Physiol.*, 1915, **30,** 1), the extraction of the lactic acid being effected by rubbing the muscle with quartz sand and saturated ammonium sulphate at −10°. Subminimal stimulation over periods from 1 to 2½ hours failed to produce any increase in the content of lactic acid. By colorimetric methods, fresh muscle extract gave P_H 7·6 (naphtholphthalein), whilst heat-rigor muscle gave P_H 6·5 (nitrophenol).—H. K.

3311. Über den Kohlenhydratstoffwechsel der isolierten Amphibienmuskeln—II. J. K. Parnas (*Biochem. Zeit.*, 1921, **116,** 71-88).—Details are given for the estimation of the carbohydrate in 0·5 to 1·5 gm. of muscle. Using this method, the author has investigated the relation between the carbohydrate consumption of a muscle, stimulated to maximum contraction several thousand times and the work done by it. The efficiency of the gastrocnemius is 35%, and the sartorius 50%. This latter value agrees with that found by Hill (*Ergebnisse d. Physiol.*, 1916, **15,** 341).—H. K.

3312. Über den Kohlenhydratstoffwechsel der isolierten Amphibienmuskeln. III. Der Umsatz in Muskeln pankreasdiabetischer Tiere. J. K. Parnas (*Biochem. Zeit.*, 1921, **116,** 89-101).—Experimental glycosuria was produced by removal of the pancreas from water-frogs. The carbohydrate consumption of the resting muscle and the amounts of lactic acid formed in resting muscle and in heat rigor were normal. The same applies under anaerobic conditions. The oxygen consumption of the muscle of the depancreatised frog was normal, but the mechanical efficiency was somewhat less. The metabolism of the muscles of diabetic animals is thus identical with that of normal muscle.—H. K.

3313. Über den mechanischen Wirkungsgrad der in isolierten Amphibienmuskeln stattfindenden Verbrennungsprozesse. J. K. Parnas (*Biochem. Zeit.*, 1921, **116,** 102-7).—By means of an apparatus which is figured and described the oxygen consumption of the gastrocnemius muscle of the frog whilst undergoing a great number of contractions was measured over a period of several hours. The work done, compared with that calculated from the oxygen consumption, showed a mechanical efficiency of 44%. This agrees closely with the efficiency determined from the carbohydrate consumption of the sartorius. The author thinks that the only source of energy in isolated muscle is therefore the carbohydrate.—H. K.

3314. Bemerkungen zur Theorie der Muskeltätigkeit. J. v. Kries (*Pflüger's Arch.*, 1921, **190,** 66-96).—An essay in which the relation of various theories, old and new, of muscular contraction is discussed, and which can only be appreciated in the original.—C. L. E.

3315. Untersuchungen an überlebenden roten und weissen Kaninchenmuskeln. O. Riesser (*Pflüger's Arch.*, 1921, **190,** 137-57).—White (extensor communis) and red (semitendinosus) muscles of the rabbit were suspended in oxygenated Locke's solution at 40° C., appropriate arrangements being made for stimulation. The preparations retain their direct excitability well, but, like most other investigators, the author failed to get a durable nerve-muscle preparation. Red muscle, unlike white, invariably gives a contraction curve in which a second peak appears on the descending limb (the so-called "Funkesche Nase"), indicating, a tonic function of the muscle. Veratrine poisoning, however, reveals this peak in white muscle, the contraction time of which is slowed;

the slow-acting red muscle is almost unaffected by veratrine, but, unlike white muscle, shows after physostigmine a prolonged contracture on the descending limb of the contraction curve. Ammonia causes a strong but reversible contracture in red, but not in white muscle. In connection with the parasympathetic innervation of muscle the author finds that frog muscle passes into contracture when immersed in 1:100,000 acetyl choline; this is removed by immersion in Ringer's solution with 1:1,000 atropine or novocaine. Nerve-free muscle is unaffected by acetyl choline; though curarisation of the animal beforehand does not affect the action of the drug on isolated muscle, yet immersion of an isolated muscle in curare and acetyl choline is not followed by contracture.—C. L. E.

3316. Lassen sich im quergestreiften Muskel des Normalen Erscheinungen nachweisen, die auf innere Sperrung deuten? P. Hoffmann (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 248-62).—The author thinks that a distinction between tonic and tetanic contraction has not yet been proved. Action currents can be detected by the string galvanometer when the muscles are at rest. During contraction the currents increase, but do not disappear after the contraction ceases.—H. W.

3317. Die autonome Innervation des Skelettmuskeltonus. S. de Boer (*Pflüger's Arch.*, 1921, **190**, 41-53).—A useful review of the literature of the subject of autonomic control of muscle tonus, which the author believes to be fully vindicated.—C. L. E.

3318. (1) **Die Bedeutung der Geschwindigkeit der Entwicklung für die Konstitution.** B. Salge (*Zeit. f. Kinderheilk.*, 1921, **30**, 1-2). (2) **Über Haut und Schweissdrüsen bei Föten und Neugeborenen.** J. Becker (*ibid.*, 3-20). (3) **Zur Entwicklung der quergestreiften Muskulatur.** A. Schmitz (*ibid.*, 21-38).—(1) Many so-called constitutional anomalies are only retarded stages of development. The 2 following papers illustrate this. (2) The thickness and the development of the corium and the number and evolution of the sweat glands show great differences on corresponding places of the skin of fœtus and new-born children of the same age. About the time of the birth the development of the skin is accelerated. (3) Considerable differences are observed between the thickness of the fibres in the muscles of the same person and between the thickness of the fibres of corresponding muscles of fœtuses of the same age. Similar differences were found in new-born children. The diameter of their muscle fibres may not reach the values found in embryos of 5 months, and, on the other hand, it may surpass the values found in children of 10 months. No constant relation exists between the number of the nuclei and the thickness of the fibres.—H. W.

3319. Über die Wirkung parasympathicotroper Mittel (Physostigmin und Scopolamin) auf die quergestreifte Muskulatur des Menschen mit besonderer Berücksichtigung der electrischen Erregbarkeit. E. Frank and M. Nothmann (*Zeit. f. d. ges. exp. Med.*, 1921, **24**, 129-41).—Physostigmine and scopolamine are antagonistic in regard to striped muscle. "Idiomuscular swelling" is excited or strengthened by physostigmine, weakened by scopolamine. Intramuscular injections of physostigmine in men produce fascicular contractions, arhythmic tremor, and increase of mechanical and galvanic irritability. Scopolamine has the contrary effect. Direct and indirect faradic irritability remain unaffected.—H. W.

3320. Über die chemischen Bedingungen für das Beibehalten der normalen Struktur der Zellen. E. M. P. Widmark and G. Lindahl (*Skand. Arch. Physiol.*, 1921, **41**, 221-6).—The experiments were carried out on finely chopped muscle, so that osmotic effects were excluded. Such material increases somewhat in weight in 0·9% pure NaCl. In a solution isotonic with this, but $20\times$millimolar in respect of $CaCl_2$, the same material loses weight. The changes are due respectively to increase and decrease of water in muscle pulp. The loss of nitrogenous material to the fluid is practically identical in the two cases.—H. H. D.

3321. Über den Abbau der Kohlehydrate im quergestreiften Muskel—I. F. Laquer (*Zeit. physiol. Chem.*, 1921, **116,** 169-222).—The amount of lactic acid formed in minced muscle usually exceeds that derivable from the original glycogen present, and in spring and summer frogs the excess of lactic acid over the original glycogen is covered by the lactacidogen content of the muscle. But if winter frogs are kept for several days at a temperature of 22° to 27°, the amount of lactic acid obtained from the minced muscle exceeds that available from the breakdown of glycogen and lactacidogen so considerably that other unknown carbohydrates must be assumed to yield lactic acid. Glycogen, vegetable starch, and hexose phosphate, added to muscle at 45°, give large amounts of lactic acid, whereas maltose, dextrose, and lævulose give rise to none. But if the reaction is carried out at 30°, some lactic acid is produced from dextrose and fructose. It is probable that glucose is not oxidised directly, but is first converted into a more readily attackable compound. It was not possible to confirm Meyerhof's statement that KCN prevents the formation of lactic acid from glycogen. The muscle of winter frogs does not convert glycogen into lactic acid, but this power is gained if the frogs are previously warmed (as above). Minced muscle converts glycogen into lactic acid only in the presence of phosphate, and not in bicarbonate solution.—H. W. D.

3322. The Lactic Acid in the Blood of Dogs in Exercise. A. B. Hastings (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 306-7).—Severe exercise of short duration increases the concentration of lactic acid in the blood, but long-continued exercise of moderate intensity decreases the concentration. The significance of lactic acid as a primary factor in physiological fatigue not carried to exhaustion seems to be an open question. —D. H. de S.

3323. Sulle variazioni delle attitudini muscolari dopo la fatica. A. Azzi (*Arch. di Sc. Biol.*, 1921, **2,** 23-30).—The term "muscular attitude" is used by the author to indicate the subjective sense of extension and force required to accomplish a movement for a certain determined purpose. This "attitude" may be graphically recorded by means of Galeotti's ergoesthæsiograph. The record thus obtained is the "muscular curve." Muscular curves change from subject to subject, but their quality is not essentially influenced by the state of rest or fatigue.—C. d. F.

3324. Tests of Muscular Efficiency. E. G. Martin (*Physiol. Reviews*, 1921, **1,** 454-75).—Title given. Unsuitable for abstraction.—J. A. H.

3325. Über den Kreatingehalt des menschlichen Herzmuskels bei verschiedener Krankheitszuständen. F. Constabel (*Biochem. Zeit.*, 1921, **122,** 152-3).—Heart muscle in a braced condition contains a higher % of creatine than when in a relaxed condition, as in fatty degeneration.—H. K.

3326. Azione della temperatura sui muscoli lisci delle rane estive e delle rane invernali. G. Viale (*Arch. di Sc. Biol.*, 1921, **2,** 59-77).—The isolated plain muscle fibres of hibernating frogs survive longer than those of summer frogs, but in the latter the spontaneous rhythmic movements of the gastric muscular ring appear more readily. The latent period is shorter in summer than in winter frogs. In the former the muscular function is more uniform, and the contraction more rapid, though, in any case, the length of the period of increasing energy diminishes as the surrounding temperature increases. The temperature coefficient shows values within the limits of van't Hoff's law. The fact that striped muscles do not follow this law is probably due to the nature of the contraction—myofibrillar in the case of striped muscles, sarcoplastic in that of plain muscles. The plain muscle fibres of hibernating frogs are more sluggish than those of summer frogs. This supports Hering's theory that energetic material (glycogen and fat) accumulates in the cells during hibernation.—C. d. F.

3327. The Selective Absorption of Potassium by Animal Cells. I. Conditions Controlling Absorption and Retention of Potassium. P. H. Mitchell and J. W. Wilson (*J. Gen.*

Physiol., 1921, **4**, 45-56).—The K content of frog muscles shows individual variations. It is higher in fresh summer frogs than in winter frogs after captivity. Muscles lose about 8 to 15% of their K on perfusion with K-free Ringer's solution, but hold the rest tenaciously. They do not lose more when stimulated under these conditions. Rubidium and cæsium are taken up by contracting muscles, not by resting muscles. Hence, excitation increases the permeability of the fibres, a confirmation of results obtained by other methods.—W. M. B.

3328. Importance of Free Ca $^{\cdot\cdot}$ Ions for Spasmophilic Phenomena. P. v. Paassen (*Ned. T. v. Gen.*, 1921, **65**, 1165).—The author reviews the opinions about the significance of Ca for these phenomena. Brinkman has pointed out (Abstract No. 2479, Vol. IV., p. 397) that the total amount of free Ca $^{\cdot\cdot}$ ions is neglected by nearly all investigators. The ionic Ca is about 20% of the total Ca of the blood. The author examines the excitability of the rabbit's nervus peroneus, after having lowered the free Ca $^{\cdot\cdot}$ ions by means of intravenous injection of $NaHCO_3$ solution $\left[(Ca^{\cdot\cdot})=K.\frac{(H)}{(HCO_3')}\right]$. The excitability is raised and, moreover, the bicarbonate content of the blood is shown to be increased (by means of the titration method of Rohonyi). Increasing the Ca $^{\cdot\cdot}$ concentration decreases the excitability. A number of different explanations about tetanic phenomena could have been reduced to a decreased quantity of free Ca $^{\cdot\cdot}$ ions.—R. B.

NERVE. REFLEX ACTION

3329. Modification de la chronaxie des nerfs moteurs et des muscles par répercussion réflexe. G. Bourguignon (*Compt. rend.*, 1921, **173**, 453-6).—The phenomenon of "repercussion" is seen in active nerve lesions and regenerations; sound nerves and muscles of the same or opposite side, if their chronaxie is identical with that of the injured nerve, are affected. Thus, after section of the ulnar nerve of one side, the chronaxie in the region of the median of the same side and of the ulnar and median of the opposite side was modified, whereas nerves—*e.g.*, musculo-cutaneous and circumflex—of widely different chronaxie were unaffected. In exceptional cases, "repercussion" can go so far as to lead to a typical reaction of degeneration. Sympathetic ophthalmia is a special case of the same law. The reflex atrophy of Charcot joints is also similar.—C. L. E.

3330. Über das Auftreten der Anfangszuckung bei niederer Reizfrequenz infolge partieller Nervenkühlung. W. Schildwächter (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 233-46).—The same excitation which produces tetanus in the muscle if the nerve is excited distal to a cooled stretch of the nerve only excites a single contraction if the proximal part of the nerve is stimulated.—H. W.

3331. Action Currents in the Phrenic Nerve. An Application of the Thermionic Vacuum Tube to Nerve Physiology. H. S. Gasser and H. S. Newcomer (*Amer. J. Physiol.*, 1921, **57**, 1-26).—A two-stage three-electrode cascade is used, resistance coupled, connected to string galvanometer through a large condenser. Inspiratory discharge to the diaphragm consists of 78 to 178 volleys of impulses at the rate of 71 to 106 per second. The waves vary in amplitude, suggesting variation in number of nerve fibres involved. Variations in form also occur to some extent, and are probably caused by slight difference in phase of the discharges from the cord. The intervals between the volleys are irregular. Records from the diaphragm show that every wave in the muscle corresponds to one in the nerve. The similarity of records from the left and right sides of the diaphragm shows that both phrenic nerves are controlled from the same place in the cord.—W. M. B.

3332. Nouvelle communication nerveuse entre les organes des appareils digestif et génito-urinaire. Vernet and G. Mones (*Arch. des mal. de l'app. digest. et de la nutr.*, 1921, No. 2).—There is in man a ganglion, not hitherto described, placed at the origin of the inferior mesenteric artery. It is the homologue of the inferior mesenteric ganglion of comparative anatomy. It is believed to establish a communication between genito-urinary organs and the lower end of the digestive tube, and to play the part of a centre in reflex actions.—W. D. H. (*Arch. méd. belges*).

3333. The Growth of the Nerve Cells in the Superior Cervical Ganglion of the Norway Rat. C. Ping (*J. Comp. Neurol.*, 1921, **33,** No. 4).—The largest cells in this ganglion grow in a manner generally similar to that observed in the albino rat.—W. D. H. (*W. I.*).

3334. Über die Abhängigkeit der Erregungsgrösse von der Reizdauer bei einem Rückenmarksreflex des Frosches. F. Plattner (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 267-76).—The flexion reflex of the frog-leg (of the same side) was effected by faradic excitation of the foot, and the reflex tetanus outlasts the excitation. This outlasting increases with the duration of the irritation, reaches its maximum when the duration of the excitation lasts 1 to 2 seconds, and then decreases gradually. With cold frogs the period is longer, and reaches the maximum after a longer duration of the excitation.—H. W.

3335. Über die Abhängigkeit der Reflexzeit von der Stärke des Reizes. F. Kauffmann and W. Steinhausen (*Pflüger's Arch.*, 1921, **190,** 12-40).—The relation between reflex time and strength of stimulus was investigated over the whole range of effective stimuli down to the threshold for various stimuli: chemical, thermal, and osmotic in the spinal frog; pain sensation (to heat) in normal and hyperalgesic human skin; and thermal reflexes in hemiplegics. The reflex time was inversely proportional to the difference between the strength of stimulus and a constant (the theoretical threshold stimulus), and, like the latency of muscle (Abstract No. 782, Vol. VI., p. 119), is expressed by a rectangular hyperbola. The relations between heat stimuli and the resulting sensation are largely explained by the time required for conduction of heat through the skin to the terminals; but the reflex time is largely dependent on central processes, the nature of which is discussed.—C. L. E.

3336. On the Hyperplasia of Nerve Centres resulting from Excessive Peripheral Loading. S. R. Detwiler (*Proc. Nat. Acad. Sci.*, 1920, **6,** 96-101).—One front limb of Amblystoma was transplanted to a position several body segments behind its place of origin. The spinal nerves which came to supply this limb were much increased in size in comparison with the normal nerves on the opposite side. An increase in size of the corresponding motor centres was not established, but measurements, cell counts, and weighings showed an abnormally large development of the sensory part of the system. (Compare Abstract No. 1371, Vol. V., p. 220.)—T. R. P.

3337. Zur feinern Anatomie der Endgeflechte präganglionmärer Fasern im Ganglion cervicale supremum des Menschen. R. Greving (*Zeit. f. d. ges. Anat. I. Abteilung; Zeit. f. Anat. und Entwicklungsgeschichte*, 1921, **61,** 1-18).—A description of 5 types of end plexuses with figures. A direct dendritic connection between 2 cells in the ganglion is described.—H. W.

3338. The Vaso-Motor Nerves of the Toad's Lung. T. Mashima (*Jap. Med. World*, 1921, **1,** 1-5).—The pulmonary vessels of the toad are contracted by adrenaline only in amounts greater than are required to cause the same action in the vessels of the lower limb. The smooth muscles of toad's lungs are stimulated by the vagus nerve; functionally these muscles correspond to the smooth muscles of mammalian animals. The resistance of the vascular system of the lung is raised by (*a*) contraction of vessel walls, (*b*) by the indirect action of contraction of smooth muscle of lung. Vaso-constrictor nerves exist in toad lungs, and the sympathetic fibres come out probably with the vagus.—J. A. H.

3339. Stereotropic Reactions of the Shovel-Nosed Ray, Rhinobatus productus. S. S. Maxwell (*J. Gen. Physiol.*, 1921, **4,** 11-18).—A study of reflex "tropistic" movements evoked by contact, even in the absence of the forebrain or labyrinth.—W. M. B.

3340. The Argyll-Robertson Pupil. S. A. K. Wilson (*J. Neurol. and Psychopathol.*, 1921, **2,** 1).—The author regards this sign as consisting in the absence, or obvious diminution, of the direct reflex to light, the consensual reflex being either absent or present, with preservation of the pupillary reaction on convergence accommodation. Myosis is not an essential symptom in the sign, though present in some 30% of the cases. The following are discussed: (1) The anatomo-physiological arc for the light reflex. (2) The path for convergence and accommodation. (3) The localisation of the lesion underlying the Argyll-Robertson pupil. (4) The myosis of many Argyll-Robertson pupils. Various possibilities and hypotheses are discussed in this important paper, to which is added a comprehensive bibliography.—J. A. H. (*Med. Sci.*).

CENTRAL NERVOUS SYSTEM

3341. The Brain Stem. V. Carbon Dioxide Effects, etc. F. T. Rogers and S. D. Wheat (*Amer. J. Physiol.*, 1921, **57,** 218-27).—Hemisphere removal in pigeons, leaving thalamus intact, does not alter CO_2 output nor ability to regulate their temperature against atmospheric cold or warmth. Destruction of the thalamus renders them poikilothermous, and the CO_2 output varies directly with body temperature, and atmospheric changes produce no reflex attempts to regulate body temperature. It is suggested that reflex changes of skeletal muscle tone and of the sympathetic induced by stimulating temperature nerves in the skin involve the thalamus as an essential part of the pathway.—W. D. H.

3342. The Anatomical and Clinical Syndromes of the Corpus Striatum. J. Lhermitte (*Neurol. Bull.*, 1921, **3,** 163).—The author gives a précis of the literature on the symptomatology and pathology of the corpus striatum. He deals first with its gross and fine anatomy and its fibre connections. Independent of the cerebral cortex, it forms an anatomically autonomous system, whose afferent fibres arise in the thalamus, and whose efferent fibres, arising almost exclusively in the pallidum (the two inner segments of the lenticular nucleus), pass to the thalamus and to masses of grey matter in the subthalamic region. The experimental physiology of the corpus striatum is treated summarily as yielding uniformly negative results. This attitude of the author is questionable, as negative results *may* have significance. The anatomo-clinical observations are numerous, and it is assumed that the striatum and pallidum are different in function. The following syndromes are given: (A) *Syndromes of the corpus striatum* (*striatum and pallidum*)—(1) Progressive lenticular degeneration (Wilson's disease); (2) pseudo-sclerosis (Westphal-Strümpell); (3) presenile and senile pseudo-bulbar syndromes and Parkinsonian syndromes of the corpus striatum. (B) *Pure striatum syndromes* (*caudatus and putamen*)—(1) Vogt's syndrome (see Abstract No. 171, Vol. VI., p. 25); (2) general rigidity and progressive athetosis; (3) Huntington's chorea, an atrophic cortico-striate degeneration; (4) Sydenham's chorea, acute striatal lesion; (5) vascular lesions of the striatum. (C) *Pallidum syndromes*—The clinical picture of paralysis agitans is characteristic of pallidal lesions. (D) *Syntheses of these syndromes.* The disorders are motor, not paralytic, and are concerned with muscle tone, voluntary, automatic, and expressive movements. Muscular rigidity is perhaps the most fundamental feature, and, except in Huntington's chorea, is found in all striate lesions. Not less important are the involuntary movements of either tremor, athetosis, or choreiform variety. Lhermitte contents himself with the general conclusion that the functions of the corpus striatum are very

different from those of the pyramidal system; the latter has to do with highly differentiated, the former with more rudimentary movement.—J. A. H. (*Med. Sci.*).

3343. Artificial Nourishment of the Brain of the Rabbit. K. Hayakawa and N. Kuno (*Namman Igakwai Zasshi* [*J. South Manchuria Med. Soc.*], 1921, **3,** No. 8).—By perfusion of Ringer's fluid and defibrinated blood through the cervical arteries and through 1 spinal artery the corneal reflex was maintained for 10 to 15 minutes, and was due to the transport of oxygen by the blood. A solution of hydrogen peroxide of a concentration that will liberate 0·1 c.c. oxygen per 1 c.c. perfusion fluid will maintain this reflex for 10 minutes, with, however, "agitation" on the part of the animal.—J. A. H. (*Jap. Med. World*).

3344. Über das Nervensystem unter normalen und pathologischen Bedingungen. IX. Die pathologische Chemie des Gehirns bei einigen Krankheiten mit dementiellem Ausgang. G. Pighini (*Biochem. Zeit.*, 1921, **122,** 144-51).—A review of the previous results of the author and of others.—H. K.

3345. Early Reactions in Spinal Cats. P. V. Prewitt (*Amer. J. Physiol.*, 1921, **57,** 291-8).—Blood-pressure becomes constant at its lower level in 2 minutes. Transection at 1st cervical segment without ligature of the vertebral and carotid arteries gives less fall of blood-pressure than if these vessels had been tied. Transection between 2nd and 3rd thoracic segments gives less fall than that at 1st cervical. There is no relationship between the blood-pressure and spinal shock. Spinal shock does not occur unless the cerebral arteries have been tied.—W. M. B.

3346. Das Sagittalorgan der Wirbeltiere. W. Kolmer (*Zeit. f. d. ges. Anat. I. Abteilung; Zeit. f. Anat. und Entwicklungsgeschichte*, 1921, **60,** 652-713).—In nearly all classes of vertebrates investigated Reissner's fibre is present in the central canal of the spinal cord. In the same series the so-called subcommissural organ in the brain was found, consisting of slender cells. Reissner's fibre takes origin here. No fixation of its posterior end could be found. Nearly all vertebrates have in the wall of their central canal specific "sense cells"; these are absent only in animals in which Reissner's fibre and the subcommissural organ are absent or rudimentary. The subcommissural organ, fibre, and "sense cells" constitute what the author terms the "sagittal apparatus." Its function is yet unknown. In man the apparatus is rudimentary, in other primates it is very well developed.—H. W.

3347. The Sensations as Reflex Manifestations of Disease. P. T. Herring (*Brit. Med. J.*, 1921, ii., 469-70).—An extension of Mackenzie's thesis (*Brit. Med. J.*, Jan. 29, 1921) that the early symptoms of disease reveal themselves in a disturbance of normal reflexes. The author regards the cerebrum as a distinct organ with definite functions, not the least of which is the translation of afferent impulses into sensations; it responds to the impulse, and thus acts as the effector organ. The cerebrum can also act as a receptor—*i.e.*, it can initiate a reflex. Perception of sensation may require memory, judgment, etc., and this activity may cause an impulse which is afferent in that it goes to the reflex centres. In the first case, therefore, the receptor is at the periphery and the effector is the cerebrum; in the second case the cerebrum acts as the receptor, and the impulse passes through reflex centres to cause the final response in a peripheral effector. According to this thesis, voluntary muscular movement becomes a reflex, inasmuch as it is initiated in the cortex cerebri, passes as an afferent impulse to a reflex centre, and is there translated into efferent impulses resulting in co-ordinated movement; and it is pointed out that many skilled movements display features common to true reflexes, and that reflex action of voluntary muscles makes use of the same mechanism (essentially) as voluntary contraction. Whether all voluntary action is reflex is not discussed.—J. A. H.

SPECIAL SENSES

3348. Ein photochemisches Modell der Retina. F. Weigert (*Pflüger's Arch.*, 1921, **190,** 177-97).—A theoretical research.—C. L. E.

3349. Influence du son sur la réaction d'une excitation tactile chez les grenouilles et les crapauds. E. M. M. Bruyn and C. H. M. van Nifterik (*Arch. néerl. de physiol.*, 1921, **5,** 363-79).—The observation of Yerkes (*Harvard Psychol. Stud.*, **1,** 627) that sound first reinforces and then reduces the reaction to a mechanical stimulus is confirmed. The effect is reversed after decerebration, and increased by hanging a weight on one foot. Section of the motor nerve of one foot reduces the reinforcement and the subsequent diminution, and delays the transition point a little. In toads the effects of sound last longer than in frogs.—C. L. E.

3350. Physiologisch-akustische Untersuchungen. II. Über das diotische Schwebungsphänomen bei einem einseitigen Tauben (Acusticus-Tumor). A. Kreidl and S. Gatscher (*Pflüger's Arch.*, 1921, **190,** 106-7).—The patient could hear beats with the normal ear alone, but not when the sound was led to both ears; this supports the previous conclusion (Abstract No. 817, Vol. VI., p. 126) that the sensation of beats is central.—C. L. E.

3351. L'odorat du chien. F. J. J. Buytendijk (*Arch. neérl. de physiol.*, 1921, **5,** 434-57).—An interesting series of experiments which illustrates the remarkable delicacy of the sense of smell in dogs, and particularly in trained police dogs. To retrieve unerringly pebbles cast on to a gravel path by as many as 6 several persons is no mean feat, though it is insignificant when compared with the following by smell of a trail some days old. Experiments showed that dogs can readily distinguish between 2 complex odours, can detect 1:10,000,000 H_2SO_4, 1:100,000 lactic acid, etc.—C. L. E.

3352. Odoriferous Substances. A. Tschirch (*Schweiz. Apoth. Zeit.*, 1921, **59,** 229-32, 241-6, 254-8, 265-72).—A discussion of the relationships between odour and chemical constitution. Whilst quality of odour cannot be correlated with constitution, yet certain groups appear to be connected with intensity of odour. The odour of a substance depends on its solubility in air and on its partition coefficient between air and the lipoid plasma of the olfactory cells. The sensation of smell is probably due to the formation of loose compounds of the odoriferous substance with the olfactory cell plasma, and is thus a chemical stimulus.—W. D. H. (*J. C. Soc.*).

3353. Tactile Localisation. J. S. B. Stopford (*J. Anat.*, 1921, **55,** 249-55).—The subject, having the part to be tested obscured, marked upon a life-sized chart the position of the stimulus, which was applied by a blunt instrument 0·2 mm. in diameter. The exact site of the stimulus was recorded on another diagram. The 2 diagrams were superposed, and the error in localisation measured in c.mm. The error for the hand and finger is between 0·4 and 1 cm., and is more accurate on the digits than upon the hand. Tactile pressure is more easily perceived over bone than over soft tissue, and in many cases is readily perceived over one of the permanent creases. In the power of localisation the different fingers do not vary. Localisation on a wrong segment may occur in normal individuals with no other disturbance of sensation. Many of the tests at present in use, in showing only gross errors, may lead to erroneous results. The foot and toes cannot be employed with any pretence to accuracy.—J. A. H.

PSYCHOLOGY

3354. Die Analyse der Sinneseindrücke. H. Öhrwall (*Skand. Arch. Physiol.*, 1921, **41,** 227-94).—A psychological discussion on the nature of sensation.—C. L. E.

3355. Über den Einfluss der körperlichen Ermüdung auf die Präzisionsarbeit. A. Apajalahti and A. Panelius (*Skand. Arch. Physiol.*, 1921, **41,** 195-9).—The skilled work

in question was threading needles. Slight fatigue caused little loss of skill (2% or less). Heavy work, such as sawing wood, depressed skill in threading needles by 9% on an average.—H. H. D.

3356. Sind Schrei und Abwehrbewegungen nach Schmerzreizen beim normalen Tier Zeichen empfundenen Schmerzes oder nur reflektorische Erscheinungen? C. Amsler (*Arch. exp. Path. Pharm.*, 1921, **90,** 257-75).—The author investigates the question whether the protective movements and cries of an animal subjected to painful stimuli are expressions of a conscious recognition of pain, or whether they are merely reflex phenomena. He makes deductions from experiments on rats, guinea-pigs, and dogs with chloral hydrate and morphine.—J. H. B.

3357. Sogenannte Empfindung des leeren Raumes. M. v. Frey (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 263-6).—Discussion of the subject. A separate sensation does not exist (contrary to the results of Schumann, *Zeit. Psychol.*, 1920, **85,** 224).—H. W.

3358. Die Magensekretion beim Menschen unter besonderer Berücksichtigung der psychischen Einflüsse. I. Saftmenge und eiweissverdauende Kraft. G. R. Heyer (*Arch. f. Verdauungskrankh.*, 1921, **27,** 227-40).—The gastric secretion was studied in hypnotised subjects. It was found that the suggestion of various foods led to an abundant formation of gastric juice, the rate of secretion and the proteolytic activity differing according to the particular food suggested.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3359. Une formation d'habitude simple chez le limaçon d'eau douce (limnæus). F. J. J. Buytendijk (*Arch. néerl. de physiol.*, 1921, **5,** 458-66).—Simple habits, such as righting of position after inversion, are acquired by application of the punishment-reward system. The progress, however, from the first attempt is only quantitative.—C. L. E.

CEREBRO-SPINAL FLUID

3360. Hæmolysin in the Cerebro-Spinal Fluid. C. Haoi (*Iji Shimbun*, 1918, No. 995, 477; *Jap. Med. Lit.*, 1921, **6,** 10).—After intraperitoneal or intravenous injection of the blood of the goat or guinea-pig into rabbits, hæmolysin was present in the cerebro-spinal fluid, and could be detected in dilutions of the fluid ranging between 1 in 5 and 1 in 10, as compared with dilutions of the serum ranging from 1 in 2,500 to 5,000.—W. D. H. (*Chem. Abstr.*).

3361. Ethylisme et liquide céphalo-rachidien. Carrieu, P. Cristol, and L. Ythier (*Bull. soc. des sci. méd. de Montpelier*, 1921, **2,** 407-10).—If there is alcohol in the food, and therefore in the blood, it passes into the cerebro-spinal fluid (analytical figures in tables). If absent from the food, there is none in the fluid.—W. D. H.

BLOOD

3362. Electric Charges of the Red Blood-Corpuscles. K. Kosaka and M. Seki (*Comm. of the Okayama Med. Soc.*, No. 372, 1921).—By observations on corpuscle suspensions under the microscope, and also on their behaviour in the usual electrophoresis **U**-tube, it was found that when suspended in 0·9% NaCl or 1·15% KCl solutions the erythrocytes of all the animals tended to move towards the anode, with the sole exception of those of the rabbit. The rate of movement of the corpuscles of the various animals seemed not to depend to any extent upon their respective diameters. In HCl, $NaNO_3$, KNO_3, Na_2SO_4, and K_2SO_4 the movements observed were similar to those in the NaCl solution. In solutions of $CaCl_2$, $MgCl_2$, and $SrCl_2$ the movement was also in the same direction, but

slower, the corpuscles of the rabbit remaining practically stationary in these solutions. In $COCl_2$, $NiSO_4$, $MnSO_4$, and $MnCl_2$ solutions all the corpuscles tried moved towards the anode, including those of the rabbit. Acids seem to favour movement towards the cathode, alkalis movement in the opposite direction. In 9·5% solution of cane sugar or isotonic solutions of other sugars, corpuscles of all species wander to the anode, but addition of salts to the sugar solution tends to reverse the direction of movement. Addition of corpuscles to an acid solution generally tends to lower the acidity, and similarly they tend to diminish the alkalinity of an alkaline solution. The rabbit's corpuscles are exceptional in influencing the acidity of an acid solution, but possess little power of neutralising alkalis; the reverse behaviour is shown by dog's corpuscles. The taking up of chlorine ions by the corpuscles was also studied, and explained in terms of an actual passage of the ions through a limiting membrane into the mass of the corpuscle. The phenomena in general are explained in terms of a theory of selective ionic permeability of the corpuscle membranes. With regard to hæmolysis, it seems that on the whole those corpuscles which are most strongly negatively charged are most easily dissolved by acids, the least powerfully charged dissolved most readily in alkalis. Ions of metals with a lower solution pressure than hydrogen are more powerful hæmolytic agents than those of a higher solution pressure.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3363. Indirect Measurement of the Blood-Corpuscles by Pyper's Method. F. L. Bergansius (*W. v/h Gen. t. Bev. v. Nat. Gen. en Heelkunde*, 2e Ser., Deel 10, 1921, p. 51).—The author has investigated the above-mentioned method (*Med. J. of S. Africa*, June-July, 1919), by which the diameter of the blood-cells is determined from the diffraction of a film of them between 2 glass plates. This method gives much smaller values than does direct measurement under the microscope. The author explains this by remarking that Pyper's apparatus represents a spectroscope with a very wide fissure. In the author's apparatus this fault is avoided. Secondly, the distances between the blood-cells have an effect upon the result, so that values may be obtained which are too large. This fault may also be avoided.—R. B.

3364. Osservazioni sui globuli rossi trattati col permanganato di potassio. L. Sabbatani (*Hæmatologica*, 1920, **1,** 485-506).—On mixing suspensions in physiological solution of rabbits' erythrocytes and a potassium permanganate solution isotonic with their blood-serum, an oxidation takes place in which the organic colloidal matter contained in the corpuscles is destroyed and replaced by colloidal manganese dioxide. This is at first in a sol, but passes into the gel state, so that the form of the erythrocytes remains almost unaltered. The colloidal dioxide is brown, and forms first in those parts of the corpuscles where the organic matter either is accumulated in greater quantity or is more avid for oxygen. The moment in which the brown colour appears and its intensity are thus the means of chemical and morphological differentiation of cells in general. The uniformity of the brown colour obtained in rabbits' red cells is against the existence of any differentiation there.—C. d. F.

3365. Sulle formazioni endoglobulari pseudo-nucleari e sugli anelli di "Cabot" messi in rilievo nei globuli rossi normali colla ipercolorazione. A. C. Demel (*Hæmatologica*, 1921, **2,** 125-46).—Neri's and Polettini's "neo-Giemsa mixtures" were used; these stain better than the usual Giemsa solution. The volume of the circulating blood-corpuscle is approximately the same as that of the normoblast from which it originates. This is because the perinuclear layer of hæmoglobinic substance is but slightly retractile, and does not shrink when the nucleus of the normoblast disappears. At the same time and for the same reason the central portion rarefies and assumes a spongy appearance. This central portion may be shown by strong stains. It is identical with the nucleoid endoglobular formations described by various authors and with Golgi's reticulo-fibrillar endoglobular body (Abstract No. 798, Vol. V., p. 125). The same stains show that

Cabot's rings are normal, and probably due to the staining of the internal and denser rim of the perinuclear substance. The red corpuscles are thus not homogeneous.—C. d. F.

3366. Contributo allo studio delle alterazioni degli elementi del sangue in diversi stati patologici. C. Boccadoro (*Hæmatologica*, 1921, **2**, 280-309).—Compare Golgi (Abstracts Nos. 798 and 2488, Vol. V., pp. 125 and 392). In anæmias caused by bloodletting or poisoning with pyrodin, Golgi's "reticulo-fibrillar" body appears larger than normal. In the same and other pathological states the centrosomes of both red and white cells appear increased in number, and are more easily shown than in normal blood elements.—C. d. F.

3367. Note sur la sédimentation des globules rouges du sang des chèvres thyroïdectomisées. J. Runnström and S. A. Schou (*Sonderdruck aus Acta zool.*, 1920, 6 pp.).—The average rate of sedimentation of the erythrocytes was distinctly higher in the thyroidectomised than in the normal goat.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3368. La sedimentazione dei globuli rossi ed il peso specifico del plasma. F. Maccabruni (*Ann. di ostetr. e ginecol.*, 1921, **43**, 8-16).—The rate of sedimentation of red blood-corpuscles depends on the density of the plasma, but in several cases of nephritis during pregnancy there was found an increased rate of sedimentation in spite of a higher salt content of the plasma.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3369. Variations in the Sedimentation of the Corpuscles and the Formation of the Buffy Coat. H. C. Gram (*Arch. Int. Med.*, 1921, **28**, 312-30).—The fibrin content of the plasma is increased in nearly all infectious diseases. The change is considered to be due to the introduction of foreign protein into the blood. The cell volume is frequently found to be low in certain infections. The difference in the rate of corpuscular sedimentation between specimens of citrated blood from normal subjects and those from diseased subjects depends mainly on differences in cell volume, and to a less extent on the percentage of fibrin. If human venous blood is left to clot, whereas normally the result is homogeneous, there are in conditions of disease 2 layers the upper being coagulated plasma, known as the buffy coat. Its formation depends on an increase in rate of sedimentation and a lengthened clotting time.—J. H. B.

3370. Über Agglutination und Senkungsgeschwindigkeit der Erythrocyten—II. W. Starlinger (*Biochem. Zeit.*, 1921, **122**, 105-19).—The addition of kaolin, bolus alba, or animal charcoal retards the sedimentation of corpuscles by adsorbing the fibrinogen. Gelatin, agar, and gum accelerate the flocculation and sedimentation. This is attributed to a diminution of the suspension stability of the corpuscles due partly to abstraction by adsorption by these substances of the breakdown products of the corpuscles and partly to withdrawal of water.—H. K.

3371. Hämolyse und Metallsalze. N. Waterman (*Biochem. Zeit.*, 1921, **116**, 165-70).—Cd, Zn, and Cu chlorides at high dilutions inhibit the hæmolytic effect of ether, but produce flocculation of the corpuscles. Mercuric chloride, however, at similar dilutions produces pronounced hæmolysis. Cadmium chloride solution also causes flocculation of lipoid solutions, and, connected with this, the observation was made that a suspension of corpuscles treated with Cd, Zn, or Cu chloride solutions, when treated with the strongly hæmolytic lipoid solution, showed no hæmolysis.—H. K.

3372. Influence of Radium and X Rays on the Frog's Leucocytes. M. M. Sturges and I. Levin (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18**, 295-7).—In the frog, as in the human being, the action of the rays consists mainly in the diminution of the relative number of lymphocytes. The injection of an emulsion of yeast into a normal frog leads to a similar result. The blood of such a yeasted frog reacts differently to the rays.—D. H. de S.

3373. Beobachtungen über die Blutplättchen der Säugetiere. L. Riess (*Arch. exp. Path. Pharm.*, 1921, **90**, 318-29).—A discussion of the relation of blood-platelets to leucocytes and red cells.—J. H. B.

3374. Piastrine e pseudopiastrine nel sangue circolante. G. Castronuovo (*Hæmatologica*, 1920, **1,** 474-84).—Whatever may be the opinion one holds as to the origin of platelets, these are always distinguishable from circulating products of the degeneration and fragmentation of other blood-corpuscles.—C. d. F.

3375. Sulla preesistenza delle piastrine nel sangue circolante. B. Polettini (*Hæmatologica*, 1921, **2,** 47-64).—Pianese (Abstract No. 799, Vol. V, p. 125) doubts the existence of platelets in the circulating blood. Polettini adduces evidence that platelets are a normal feature of the circulating blood of mammals, and that it is easy to distinguish them from disintegration products of other blood elements.—C. d. F.

3376. Über die Verwendung der in Körperflüssigkeiten vorhandenen Schutzkolloide beim Kongorubin. M. R. Bonsmann (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 66-83).—The protective effect in colloidal solutions on the precipitation of congorubin by electrolysis is used to determine the protein content of the serum and to differentiate in pathological cases between hydræmic transudations, transudations due to congestion, and exudations. The concentration of the salt solution has an influence on the protective action of the colloids.—H. W.

3377. Vergleichende Blutuntersuchungen bei Mutter und Neugeborenen. Beobachtung über Oberflächenspannung des Serums und Hämolyse. L. Fuhrmann (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 84-95).—The blood of new-born children coagulates more slowly than that of the mother. The surface tension of the fœtal serum is much less. This difference cannot be explained by the physiological hyperbilirubinæmia of new-born children. The surface tension of the serum of mothers with eclampsia is smaller than normal, and shows no difference from the serum of their children. In experiments on hæmolysis produced by alkali salts, the anions may be arranged in both maternal and fœtal blood in the same way. The series is $SO_4 < Cl < Br < NO_3 < I$. K salts have more effect than Na salts.—H. W.

3378. Les dialysats du plasma. W. Mestrezat (*Bull. soc. sci. méd. de Montpelier*, 1920-21, **2,** 363-4).—Filtration through collodion produces a filtrate which is not the same thing as an equilibrated dialysate. In the body the equilibrium is restored by salts, especially chlorides. The author reiterates his old view that cerebro-spinal fluid and aqueous humor are equilibrated dialysates.—W. D. H.

3379. Die Verteilung des Harnstoffes im Organismus. K. L. Gad Andresen (*Biochem. Zeit.*, 1921, **116,** 266-302).—This paper contains a complete study of the amount of urea found in various parts of the body. The distribution coefficient of urea between plasma and corpuscles and between Ringer's solution and corpuscles is between 0·72 and 0·8. Between plasma and the various secretions the coefficient is unity, whilst between plasma and water-free fat it is 0·07. The concentration of urea is the same in all tissues and in the blood, with the exception of the fatty tissues, and the concentration of ammonia is the same in the blood, the secretions, and the various organs.—H. K.

3380. Distribution of Uric Acid in the Blood. R. C. Theis and S. R. Benedict (*J. Lab. and Clin. Med.*, 1921, **6,** 680-3).—Uric acid was determined in plasma and corpuscles in 104 cases, 51 of which showed equal distribution, 45 showed plasma uric acid greater than corpuscle uric acid, and 8 the converse. This relationship holds for oxalated and defibrinated blood, and does not depend upon pathological conditions. Added uric acid did not penetrate the corpuscles in 70% of 20 bloods studied. In 30% of the cases the added acid was equally distributed between corpuscles and plasma. It is suggested that other cells in the body may show similar differences in permeability.—D. H. de S.

3381. Über Sulfat- und Esterschwefelsäure in normalen und pathologischen Körperflüssigkeiten. W. Heubner and R. Meyer-Bisch (*Biochem. Zeit.*, 1921, **122,** 120-7).—Normal serum contains about 0·02% of sulphate, which can be dialysed out with the

chlorides, but is adsorbed by the proteins when these are precipitated. In pathological exudates there was one-third less sulphanion and a small proportion of sulphuric acid in ester form. This latter shows an increase after sulphur injections in diseases of the joints.—H. K.

3382. Medico-Legal Application of Human Blood-Groupings. R. Ottenberg (*J. Amer. Med. Assoc.*, 1921, **77,** 682-3).—Evidence from agglutination tests can be employed in deciding cases of disputed paternity or of legitimacy.—C. L. E.

3383. Occult Blood. (1) I. Boas, (2) J. Koopman (*Arch. Verdauungskr.*, 1921, **27,** 37-63, 122-7).—In the first paper the spectroscopic method is looked on as the best. It is improbable that oxidases play any significant rôle in testing for occult blood in fæces. The second author reviews various methods, and finds that the benzidine method is the most delicate, though interfering substances may enhance the effect.—W. D. H. (*Chem. Abstr.*).

3384. Über Blutpigmente. S. Sawa (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **24,** 149-236).—Most of the paper deals with methods of fixation, etc., and of detection of iron microchemically, and of derivatives such as melanin, hæmatoidin, and hæmosiderin. The last named is formed intracellularly, has a brown tint, is formed from hæmoglobin, but not after intraperitoneal injection of hæmatin. Eosinophile granules give the iron reaction, and are stated to be formed from hæmoglobin. The pigment formed by adding formalin to blood is similar to hæmatin and identical with "malaria pigment." After hæmoglobin is injected in normal dogs it leaves the body, not by glomeruli or Henle's loop, but by the kidney tubules; drop formation in the epithelium here occurs at the same time, and is due to hyaline degeneration.—W. D. H.

3385. Reaction of the Blood. C. L. Evans (*Lancet*, 1921, ii., 867-9).—A much needed article. If medical science is to progress, medical men must understand the new language of physical chemistry. The article explains the terms used, with admirable simplicity and without calling too severely on the doctor's knowledge of arithmetic. The headings are, the meaning of reaction, P_H and its estimation, buffers, and "acidosis." In the last section, where clinical help is so much wanted, the need for a revision of nomenclature is urged.—W. D. H.

3386. Ricerche sulla reazione attuale del siero di sangue. A. Chistoni (*Hæmatologica*, 1921, **2,** 213-47).—After blood-letting the concentration of H ions in the blood-serum is increased if the loss of blood lowers the blood-pressure and causes the passage of lymph into the blood-stream. The lymph from the thoracic duct is more alkaline than the blood-serum. Its reaction does not change during experimental lymphorrhœa. The H-ion concentration of the blood-serum also rises by preventing the passage of lymph into the venous blood. The change in reaction by blood-letting may last in small dogs up to 6 hours, at which time the reaction is again normal.—C. d. F.

3387. Injection of Splenic Fluid and the Influence of the Spleen on Blood-Coagulation. H. Ohara (*Jap. Med. World*, 1921, **1,** 5-7).—After injection of spleen juice white corpuscles increase generally in number; small lymphocytes, however, decrease. A lessened coagulability of the blood is found. Exposure of the spleen to X rays shortens the coagulation time, a result also produced by moderate local diathermy. Thrombin is increased in amount.—J. A. H.

3388. Un nuovo metodo per saggiare il potere coagulante del sangue. Alcune ricerche speciali eseguiti su ammalati. M. Gelera (*Rif. med.*, 1921, **37,** 149-51).—The coagulability of the blood is estimated by noticing that degree of dilution with sodium citrate which will just prevent clotting in 1 hour at body temperature. Leucocytosis appears not to affect the coagulability, but there appears to be a relationship between this property and the opsonic index. Owing to effects due to Ca salts, in tuberculosis, even with a good opsonic index, the clotting power is small.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

HEART

3389. The Output of the Heart in Dogs. G. N. Stewart (*Amer. J. Physiol.*, 1921, **57,** 27-50).—The author's method of injecting salt solution and determining the concentration of salt in the blood at the time of its maximum concentration was used in most experiments. A modification of the method is to collect blood during the whole time at which the mixture is passing the place of collection. The degree to which the salt solution is diluted by blood gives the volume passing through the heart during the time of injection. The estimation is made by electrical conductivity, as also the time at which the mixture reaches the point of collection. Results obtained agree with those of other workers.—W. M. B.

3390. Factors determining the Relative Intensity of the Heart Sounds in Different Auscultation Areas. C. J. Wiggers (*Arch. Int. Med.*, 1919, **24,** 471-88).—Heart sounds were recorded by the method of Wiggers and Dean (Abstract No. 951, Vol. II., p. 237). The intensity of the 1st sound depends, not on the systolic output, but on the tension set up during the isometric phase of systole, while the intensity of the 2nd sound depends on the aortic (or pulmonary) pressure at the commencement of diastole. Experiments support the current view that the sounds heard over the 2nd left and 2nd right intercostal spaces arise in the right and left hearts respectively.—C. L. E.

3391. The Auriculo-Ventricular Bundle in Mammals. A. H. Holmes (*J. Anat.*, 1921, **55,** 269-85).—Anatomical. The macroscopic and microscopic variations in sheep, lamb, calf, pig, gazelle, camel, man, child, rabbit, guinea-pig, cat, monkey, and hedgehog are described. There are 20 micro-photographs.—J. A. H.

3392. Am flimmernden Säugetier-Ventrikel. B. Kisch (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 106-28).—The course of the contraction wave at any given spot of the fibrillating ventricle, as judged by the electric action current, is constantly changing. There is no regular relationship between the different parts of the fibrillating ventricle, as may be shown by simultaneously leading off from any two points (multiple stimulation foci).—H. W.

3393. The Restoration of the Cardiac Mechanism in Cases of Auricular Fibrillation by Means of Quinidine Sulphate. A. N. Drury and C. C. Iliescu. **How Quinidine Sulphate acts in Auricular Fibrillation.** T. Lewis, A. N. Drury, C. C. Iliescu, and A. M. Wedd (*Brit. Med. J.*, 1921, ii., 511-5).—Thirteen cases of auricular fibrillation were treated with quinidine sulphate. In 6 cases the normal rhythm was re-established, while in the remaining 7, although similar changes were produced in the retardation of the auricular rate, the movement persisted without break, and the rate returned upon withdrawal of the drug to its original level. Quinidine brings fibrillation of the auricle to an end by prolonging the refractory period of the auricle and delaying the recovery of the tissue, thus rendering the gap between the crest and the wake of the circulating wave shorter and eventually abolishing it. When the last event happens the abnormal action of the auricle ceases, and the normal impulses are thus enabled once again to resume control.—D. H. de S.

3394. Über den Einfluss der Körperlichen Anstrengung auf das Herz. T. Hiramatsu (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **22,** 189-244).—Details are given of the harm produced in the heart (dilatation, hypertrophy) of experimental animals by severe muscular work.—W. D. H.

3395. Pour servir à l'interprétation de l'électrocardiogramme (E.C.G.).—IV. L'E.C.G. des sauriens et des ophidiens. H. Fredericq (*Compt. rend. soc. biol.*, 1921, **85,** 661-3).—In *Chalcides tridactylus*, *Lacerta viridis*, etc., the E.C.G., not only of the whole heart, but also of the auricle alone, shows P, R, and T waves. The E.C.G. therefore represents,

not the microscopical disposition of the heart (the direction of main lines of conduction), but the histological structure of the myocardium. The R and T waves possibly represent the activity of the myofibrils and sarcoplasm respectively.—J. H. B.

3396. Observations on the Heart in Diphtheria. S. C. Smith (*J. Amer. Med. Assoc.*, 1921, **77,** 765-72).—An electrocardiographic study. Pulse abnormalities are initial tachycardia and convalescent irregularities. Tachycardia persisting to convalescence is often a precursor of heart block. Convalescent irregularities are often merely due to sinus arrhythmia or sino-auricular block (65%); 20% are due to premature contractions; while 15% (all fatal) have high-grade heart block. Digitalis is contraindicated.—C. L. E.

3397. Über die Trennung der intracardialen Vagusfunction von der motorischen Leistung des Froschherzens. IV. Versuche über Giftwirkungen. V. Weitere Gefrierversuche. L. Haberlandt (*Zeit. Biol.*, 1921, **73** [N.F. **55**], 285-318).—In hearts of frogs paralysed by strychnine, caffeine, veratrine, and quinine, and then revived by irrigating with blood, a permanent dissociation of the vagus end apparatus was observed. Digitalin has not this effect (compare Abstract No. 2163, Vol. VI., p. 313).—H. W.

3398. Artificial Extra Pause of the Ventricle of the Frog's Heart. S. de Boer (*Amer. J. Physiol.*, 1921, **57,** 179-88).—An auricular extra systole produced at the beginning of a ventricular systole is not always followed by an extra systole of the ventricle. This failure occurs when the excitation wave reaches the ventricle during its refractory period. The failure is more certain when the refractory period is prolonged by the action of barium, veratrine, digitalis, or antiarin, or if evoked in the beginning of a post-compensatory systole. A prolonged pause can also be produced by increasing the refractory period and applying a shock in the A-V groove near the end of diastole, but during the refractory period. The auricles then respond, but not the ventricle. The excitation wave passes on to the sinus, but the natural sinus impulse travels through the auricles in the opposite direction. Hence there is interference, and no ventricular systole follows.—W. M. B.

3399. Rhythm and Metabolism of the Bled Frog's Heart. S. de Boer (*Amer. J. Physiol.*, 1921, **57,** 189-217).—The excised heart may pass into halved ventricular rhythm spontaneously. A short time before this the "metabolic" state is deteriorated, as shown by longer refractory period, slowing of conduction, longer A-V interval, and decrease of contractility. This state improves after the half-rate appears. This half-rate may be converted to normal by an induction shock in diastole. An extra systole in the period of normal rhythm may re-establish half-rhythm. This is due to the increased refractory period produced by the greater systolic activity. Ventricular alternation is an intermediate stage between normal and half-rate. After artificial conversion of the half-rhythm to normal, the contractility and conduction rate gradually decrease, and conversely. At a particular rate of beat, the optima of contractility and conductivity were reached, but the rate was not the same for both. The mechanical latent period is lengthened when the rate of conduction of the excitation wave diminishes. The electrical latent period is longer when the metabolic state deteriorates.—W. M. B.

3400. Action of Guanidine and Methyl Guanidine on the Isolated Frog's Heart. G. Rosenow (*Zeit. exp. Med.*, 1921, **12,** 263-8).—These cause diastolic arrest, but this is reversed by thorough washing. There is no evidence that these materials play any part in anaphylactic shock, for the necessary dose is greater than could arise from the breakdown of parenterally introduced protein.—W. D. H. (*Chem. Abstr.*).

3401. Das Ionengleichgewicht der Zellen. Gleichzeitig ein Beitrag zur Physiologie des Natriums. S. G. Zondek (*Biochem. Zeit.*, 1921, **121,** 87-108).—Hearts were perfused with various concentrations of solutions containing Na, K, and Ca ions. Osmotic

pressure and NaCl activity are not parallel. The heart can adjust itself to other concentrations of the ions mentioned than the normal. The antagonistic action of Ca to K and to Na is thought to be related to the atomic number of these elements, for whereas the difference of atomic number of K and Ca is unity, and their relative intensity is approximately equal, Na has an atomic number 9 less than Ca, and its antagonistic action is much less.—H. K.

3402. Wirkung des Cocains auf das Froschherz und seine Gewöhnung an das Gift. M. Kochmann (*Pflüger's Arch.*, 1921, **190,** 158-72).—Concentrations below 1/300,000 molar are ineffective; between 1/160,000 and 1/300,000 may slightly improve the amplitude of the beat; 1/20,000 to 1/100,000 causes slowing and reduction of amplitude; 1/20,000 to 1/2,000 first slow and weaken, and finally arrest the ventricle; while 1/2,000 molar solutions cause diastolic arrest, first of ventricle, then of auricle (1/1,000 molar= 0·034%). Partial accommodation to the more moderate strengths may occur, and complete recovery when the drug is replaced by pure Ringer's solution.—C. L. E.

3403. Über inverse Herzwirkungen parasympathischer Gifte. R. Kolm and E. P. Pick (*Pflüger's Arch.*, 1921, **190,** 108-17; see Abstract No. 2559, Vol. VI., p. 369).—Acetyl choline, muscarine, and pituitrin do not cause diastolic arrest in the isolated hearts of summer frogs perfused with a fluid rich in Ca; if there is also a deficit of K, they even cause contracture. Atropine does not affect the contracture caused by Ca-acetyl choline, but ergotamine can prevent it. The contracture is therefore supposed to be due to a stimulation of sympathetic nerves rendered over-excitable by Ca; in other words, a latent sympathicotropic property of these "vagal" drugs is revealed under these conditions. The acetyl choline contracture does not take place after the application of an auriculo-ventricular ligature.—C. L. E.

3404. Sind die Chlorionen der Ringerlösung im schlagenden Froschherzen durch andere Anionen ersetzbar? E. R. O. Finckh (*Biochem. Zeit.*, 1921, **116,** 262-5).—An isolated frog's heart continues to beat when all chloridion is replaced by bromidion. The replacement by the iodide or nitrate ion exerts a harmful effect, owing to formation of free iodine or nitrite.—H. K.

3405. Die Bedeutung kolloidaler Nährlösungen für die Funktion des normalen, erschöpften und vergifteten Herzens. S. G. Zondek (*Biochem. Zeit.*, 1921, **116,** 246-61).—Perfusion of the frog's heart with Ringer's solution rendered isoviscous with serum by the addition of soluble starch or gum-tragacanth has no abnormal effect, but use of gelatin or gum-arabic increases the tonus and acts as a restorative. This action is due to the Ca present. Bayliss's 7% gum-saline solution can probably be replaced by a Ringer's solution of increased calcium content.—H. K.

3406. Kalium und Radioaktivität. S. G. Zondek (*Biochem. Zeit.*, 1921, **121,** 76-86).—Using a Straub's heart preparation, the author failed to confirm any of Zwaardemaker's observations. Zwaardemaker's success is attributed to the use of antiquated methods.—H. K.

CIRCULATION

3407. The Mechanism of the Recovery or Maintenance of Systemic Blood-Pressure after Complete Transection of the Spinal Cord. Anna B. Yates (*Amer. J. Physiol.*, 1921, **57,** 68-94).—If the spinal cord is divided in cats at various levels below the 1st thoracic segment, the blood-pressure recovers to a degree which depends upon the position of the section and the length of time allowed for recovery. The sympathetic outflow left under the control of the vaso-motor centre in the bulb—that is, the segments on the bulbar side of the section—appear to be responsible for this recovery. The spinal cells of origin of the vaso-constrictor fibres below the transection do not take any important

part. There is no evidence of the existence of spinal vaso-motor centres of co-ordinate rank with the bulbar centres.—W. M. B.

3408. Ricerche sul tono vasale. C. Foà (*Arch. di Sc. Biol.*, 1921, **2,** 1-22).—Experiments were made with frogs' hind-limbs (Laewen-Trendelenburg's method) and with the rabbit's isolated ear (method of Bissemski-Rieschbieter). Solutions of viscum album are always vaso-dilating, even if the bloodvessels are contracted by adrenaline; then, however, the vaso-dilating action is very transitory. This shows that viscum album acts on plain muscle fibres, the tone of which is lowered. Fresh solutions of chloral hydrate prepared with Ringer's fluid have a slightly vaso-dilating action; old solutions are vaso-constricting in consequence of the formation of trichloracetic acid. Ether dissolved in Ringer's fluid is vaso-constricting for the frog preparation, vaso-dilating for the rabbit preparation. Ergot and its various commercial extracts are always vaso-dilating. They paralyse the neuro-muscular junctions in the vascular walls, and their use for stopping hæmorrhage, except in uterine cases, is therefore absurd. Atropine has a lasting vaso-dilating action. Sodium nitrite and nitroglycerol have a slight vaso-dilating power; but this is increased in the case of nitroglycerine if large quantities of blood are added. Amyl nitrite is vaso-dilating when dissolved in Ringer's fluid in the proportion of 0·005%, but vaso-constricting at the concentration of 0·05% unless defibrinated blood is added. The same effect can be obtained in less degree by using a solution of hæmoglobin crystals. Methæmoglobin solutions have no influence upon the vaso-constricting action of amyl nitrite dissolved in Ringer's fluid.—C. d. F.

3409. Contributo alla fisiologia dei vasi sanguiferi—I. and II. G. Vernoni (*Arch. di Fisiol.*, 1921, **19,** 123-62).—Rabbit or horse serum favours the contractions of rings of calf arteries due to adrenaline, $BaCl_2$, and nicotine. The action is immediate. Ox pericardial fluid has a favourable but almost instantaneous influence on contractions due to electric stimuli when applied on the internal surface of the artery, but has no action when applied on the external surface. Adrenaline has likewise a contracting action only when applied on the intima. $BaCl_2$ causes arterial contractions when applied on either surface, but applied internally the contractions occur immediately, while applied externally they begin gradually. In contractions due to adrenaline and $BaCl_2$, ox's pericardial fluid has about the same effect as blood-serum. The flow of a fluid within a bloodvessel has an inhibitory influence on contractions due to electric stimuli; this is maximal when Ringer's solution is used, minimal for pericardial fluid. A sudden distension of an artery increases its electric excitability; but this is a little modified by a gradual increase of the intravascular pressure. From a physiological point of view the intima and media of bloodvessels form one unit.—C. d. F.

3410. Haben die rhythmischen Spontankontraktionen der Gefässe einen nachweisbaren Einfluss auf den Blutstrom? K. Wachholder (*Pflüger's Arch.*, 1921, **190,** 222-9).—No.—C. L. E.

3411. Über die Wirkung der Blutbestandteile auf die peripheren Blutgefässe. S. Matsumura (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **23,** 1-32).—Fresh plasma and serum from venous and arterial blood (rabbit) have little or no vaso-constrictor action on the rabbit's ear vessels; the serum is more active, especially a day or two later; if hæmolysis has occurred, or a little hæmoglobin is added, the vaso-constrictor action is marked. O'Connor's adrenaline-like substance in serum can be explained partly by hæmolysis, and in part by changes in physical condition of the serum colloids.—W. D. H.

3412. Über den Einfluss der Wasserstoffionenkonzentration auf die Gefässe. E. Atzler and G. Lehmann (*Pflüger's Arch.*, 1921, **190,** 118-36).—By perfusion of frogs with gum Ringer's solution of varying P_H with an apparatus previously described (Abstract No. 2440, Vol. V., p. 385), it was found that between 5 and 7 there was no

change in the perfusion rate; below 5 there was vaso-constriction irrespective of the nature of the anion, while above 7·1 there was also vaso-constriction. Whether the central nervous system was intact or destroyed was immaterial. The authors incline to an explanation along the lines of the " quellung " hypothesis.—C. L. E.

3413. Étude de la circulation du membre supérieur par l'oscillographie, la pléthysmographie et la capillaroscopie simultanées. C. Laubry, S. Bloch, and J. Meyer (*Compt. rend. soc. biol.*, 1921, **85,** 649-51).—A human subject is laid on his back with right arm outstretched. The brassard of an oscillometer is applied to the wrist, and pulse oscillations are recorded. The second and third fingers are placed in a plethysmograph, and a record taken of their volume changes, while the fourth finger is examined under the capillaroscope. If the arm is compressed with a pressure greater than systolic pressure, and then gradually decompressed, the following changes may be observed: When decompression begins, the finger volume remains unchanged or slightly diminishes; there follows a rise in the volume, which reaches a maximum, and then diminishes until decompression is complete. Coincident with the rise of finger volume there is an increased capillary circulation. The flow is much more rapid. When the finger volume begins to decrease, the flow slackens and the finger blanches.—J. H. B.

3414. Über den Erfolg von Infusionen in eine Vene des grossen Kreislaufes und in die Pfortader. M. Yamada (*Biochem. Zeit.*, 1921, **122,** 168-87).—The dilution of the blood is smaller when injections are made into a branch of the portal vein; the urine secretion is also faster.—C. L. E.

3415. Über die Blutbewegung in den Capillaren. (2) Beziehungen zwischen Strömungsgeschwindigkeit und Druck. A. Basler (*Pflüger's Arch.*, 1921, **190,** 212-21).—In the capillaries of human skin, the velocity of flow varies much, as observed also by Bruns and König (*Zeit. f. physik. u. diätet. Therap.*, 1920, **24,** 21). In the slowly circulating areas the lumen of the capillaries often appears greater than normal, so that the increased resistance must be sought in the pre- or post-capillary vessels; the method chosen was to compare pressure and velocity simultaneously, when, if the resistance is on the arterial side, the pressure should fall, while if on the venous side it should rise. The velocity was measured in skin capillaries under direct observation by moving a device inside the ocular at an adjustable speed equal to the apparent movement of the corpuscles; pressure was measured by an equally ingenious device previously described (Abstract No. 493, Vol. IV., p. 82). A modification of V. Kries' method is also described. Results are not given.—C. L. E.

RESPIRATION

3416. The Changes in the Concentration of the Carbon Dioxide resulting from Changes in the Volume of the Blood flowing through the Medulla Oblongata. A. B. Hastings, Helen C. Coombs, and F. H. Pike (*Amer. J. Physiol.*, 1921, **57,** 104-9).—Restriction of the blood-supply to the bulb by temporary occlusion of cerebral arteries caused hyperpnœa, with a reduction of CO_2 in the blood. Hence the effect is produced in the nerve cells themselves. Considerations as to the application of the law of mass action and the principle of Le Chatelier to the phenomena are given.—W. M. B.

3417. Über Atmung in bewegter Luft. W. Senner (*Pflüger's Arch.*, 1921, **190,** 97-105).—The subjective sensations attending respiration in a strong wind—(i.) that the mouth and nose cannot be shut quickly enough, and (ii.) that not enough air is breathed—are principally due to variations in the wind velocity, which necessitate constant adjustment of the respiratory effort. With a steady wind the position of mean inflation is determined by the passive elasticity of the lungs and chest under the

particular differences of internal and external pressure produced by the wind. Although experiments showed that with increasing inflation the maximal possible inspiratory pressure diminished, while the expiratory pressure rose, and vice versa, this could not (even when in rapidly moving aircraft) be sufficient to hinder respiration materially. —C. L. E.

3418. Die Wasserstoffionenkonzentration als Regulator der Atemgrösse. A. Fleisch (*Pflüger's Arch.*, 1921, **190,** 270-9).—The P_H and the CO_2 tension of arterial blood of lightly urethanised rabbits were determined by Hasselbalch's and Krogh's methods, and the pulmonary ventilation measured. Slow infusions of NaH_2PO_4 were then given—about 15 c.c. of $\frac{1}{6}$ molar in an hour—and the observations repeated. Ventilation was increased and the blood was more acid, though the CO_2 pressure was reduced. Hence it is argued that it is the C_H, and not the CO_2, tension that stimulates the centre. —C. L. E.

3419. Zur Physiologie der Drüsen. XLVIII. Über den respiratorischen Stoffwechsel des milzlosen Hundes. L. Asher and C. Koda (*Biochem. Zeit.*, 1921, **122,** 154-60).—The gaseous metabolism of normally fed dogs which have had the spleen removed is normal. This differs from the results of others on rats and rabbits.—H. K.

3420. Zur Physiologie der Drüsen. XLIX. Der respiratorische Umsatz des milzlosen und eisenarm ernährten Hundes. L. Asher and F. H. Doubler (*Biochem. Zeit.*, 1921, **122,** 161-7).—Extirpation of the spleen coupled with an iron-free diet has no action on the gaseous respiratory metabolism or on the coagulation time of the blood. The hæmoglobin content of the blood only falls off very slowly.—H. K.

3421. Influence de la castration sur les échanges respiratoires, la nutrition et le jeûne. C. Heymans (*J. de physiol. et de pathol. gén.*, 1921, **19,** 323-31).—Total castration of the cock reduces respiratory exchange by 20 to 30%. Partial castration, without alteration of morphological characters, reduces it by 15%. The excess in the normal animal is due to greater consumption of food. On the third day of fasting, the respiratory exchange of the normal animal is reduced to that of the castrated one. The normal cock is less resistant to inanition than the castrated one, its daily loss of weight being much greater. This is apparently due to the fat reserve of the castrated animal.—W. M. B.

3422. Production de chaleur et échanges respiratoires du système nerveux. A. O. de Almeida (*J. de physiol. et de pathol. gén.*, 1921, **19,** 289-304).—Brain substance, ground up and suspended in defibrinated blood, consumes large amounts of oxygen and gives off large amounts of CO_2. Heat in large quantity is also produced. The heats of combustion are much higher than those of any known food material.—W. M. B.

3423. Berichtigung. "Über die Bedeutung des respiratorischen Quotienten usw." S. Weiss (*Biochem Zeit.*, 1921, **121,** 40).—A small correction to a former paper by the author (Abstract No. 1449, Vol. V., p. 233).—H. K.

ALIMENTARY CANAL

3424. Zur Kenntnis der Submaxillarspeicheldruse. M. Miwa (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **24,** 79-102).—Atropine does not affect oxygen usage in the submaxillary; pilocarpine increases it, but not much after atropine; its action is compared to the specific effect salicylic derivatives (*e.g.*, diuretin) have on the kidney. Chorda stimulation has a similar effect, except after atropine; sympathetic stimulation has no effect.—W. D. H.

3425. Ricerche sulla reazione chimica della saliva. R. D'Alise (*Arch. di Sc. Biol.*, 1921, **2,** 141-6).—The reaction of mixed human saliva may be either slightly acid or

slightly alkaline. An alkaline reaction is the more frequent. There appears to be no relation between dental caries and reaction of the saliva.—C. d. F.

3426. Le oscillazioni pulsatorie dell' esofago, nella fisiologica e nella patologia dell' attività cardiaca. G. Meldolesi (*Malatt. del cuore*, 1921, **5,** 2-15).—The œsophageal pulse was recorded by means of Röntgen rays after the swallowing of a barium sulphate mixture. It was found to be influenced in a characteristic fashion during cardiac disorders.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3427. Visceral Sensory Nervous System. X. The Vagus Control of the Œsophagus. A. J. Carlson and A. B. Luckhardt (*Amer. J. Physiol.*, 1921, **57,** 299-335).—In turtles, section of the vagi causes hypertonus. Stimulation of the peripheral end gives inhibition. The gastric vagi are motor. No evidence of sympathetic innervation of the œsophagus was obtained. In frogs, section of vagi is followed by hypermotility of the œsophagus and stomach, due chiefly to mechanical stimulation of motor fibres. Electrical stimulation gives marked motor effects. No direct evidence of the presence of inhibitory fibres was obtained. Adrenaline inhibits peripheral automatic activity. —W. M. B.

3428. Über die Wirkung der Verschiebung der K und Ca Ionen auf den überlebenden menschlichen Magen. O. Tezner and M. Turolt (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 1-10).—Addition of Ca to Ringer's solution inhibits the movements of the stomach. This inhibition is abolished by acetyl choline and $BaCl_2$, but not by nicotine. The effect of adrenaline is greater in Ca-rich Ringer's solutions than in normal Ringer's solution. The addition of K causes automatism; this is not neutralised by atropine, but it is by papaverine. Besides the effect on the muscle, there is paralysis of the inhibitory sympathetic nerves, and excitation of the accelerator nerve endings. Addition of K has no influence on the acetyl choline effect, and diminishes the adrenaline effect. The movements of the stomach are inhibited in Ca-free solutions, due to a diminution of the excitability of the vagus. Acetyl choline has a smaller effect than in normal Ringer's solution. In the K-free solution, some of the preparations showed an increase, and some an inhibition of the rhythmic movements. Adrenaline and acetyl choline showed greater effects in this condition.—H. W.

3429. The Gastric Mucosa. P. G. Unna and E. T. Wissig (*Virchow's Arch.*, 1921, **231,** 519-39).—Views on gastric secretion are stated to need revision. The main constituent of the chief cells is a proteose termed cytose. It is absent in the investing cells. This substance is regarded as a protective substance for gastric juice. By means of staining with $KMnO_4$ strongly reducing granules can be demonstrated in the chief cells. These possess an unknown function. The source of pepsin is still to be determined. Heidenhain's view that HCl is produced by the parietal cells is supported. The finding of eosinophile cells in the stomach of the rat (Y-cells) opens up a field for investigation as to their distribution in other animals, and their relation to function. These Y-cells show great resistance to trypsin.—W. D. H.

3430. Physiologie der Verdauung. VIII. Die Bedeutung der Chlorverarmung des Körpers für die Magensaftsekretion. R. Rosemann (*Pflüger's Arch.*, 1921, **190,** 1-11).—The author has previously shown (*Pflüger's Arch.*, 1911, **142,** 208) that when the Cl content of the body has been reduced by 20%, the HCl content and the total amount of gastric secretion is much reduced, and finally secretion stops and appetite vanishes. Quite different conclusions were reached recently by Takata (Abstract No. 2938, Vol. V., p. 469). Among the causes for the discrepancy is the inadequate nutrition of Takata's dog, which lost 22% of its weight; the autolysis of muscle substance would liberate enough chloride to enable gastric juice with nearly normal HCl content to be secreted.—C. L. E.

3431. Gastric Secretion in the Suckling. I. Chievitz (*Ugeskrift f. læger*, 1920, **82,** 1529-43 [Danish]).—By using a test meal of sweetened barley-water it was found that

all healthy children, whether milk fed or not, showed the same concentration of free HCl in the gastric juice. But infants under the age of 1 year possess normally a smaller percentage of free HCl than older children. The amount is also reduced during acute and chronic digestive disturbances, but among the 53 children examined no case of congenital achylia was found.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3432. Über Wechselbeziehungen zwischen der Blutbeschaffenheit (Cl und H_2O beziehungsweise Eiweissgehalt des Blutserums) und HCl Sekretion des Magens. M. Leist (*Wien. Arch. f. inn. Med.*, 1921, **2,** 491-508).—A small influence of the secretion of the gastric juice on the Cl and H_2O content of the blood can only be observed in cases of hyperacidity and hypersecretion. An increase in the blood of Cl and H-ions has no influence on HCl production. This is also independent of all degrees of anæmia as long as the protein content of the serum is normal, and decreases with the diminution of the serum protein.—H. W.

3433. Über den Einfluss der Röntgenstrahlen auf die Magensaftsekretion. E. Szegö and J. Rother (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 270-88).—In therapeutic doses Röntgen-rays have no effect on the gastric secretion in dogs. Larger doses cause an increase, and still larger doses produce atrophy of the mucous membrane and cachexia of the animal.—H. W.

3434. Über den menschlichen Magensaft. I. Über die Potentialdifferenz der gesättigen Calomelelectrode. II. Pepsin und Trypsinverdauung. T. Itakura (*Mitt. a. d. med. Fac. k. Univ.*, Tokio, 1920, **24,** 129-48, 277-323).—I. deals only with method; the paper should be read by those interested in a mathematical exposition of H-ion concentration. II. is also mathematical, and deals with methods of estimating enzyme activities on casein.—W. D. H.

3435. Gastric Resection. I. Experimental Data on the Duodenal Loop. W. H. Barber and L. C. Lange. **II. Surgical Pathology.** W. H. Barber and L. Celano (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 286-9).—Diagrams are given to show different methods of gastro-duodenal and gastro-jejunal anastomosis possible after resection of the pyloric end of the stomach. Those methods which are compatible and those which are incompatible with life are indicated. Of the dogs on which these operations were performed, most of those that died showed evidence of pancreatitis.—D. H. de S.

3436. Report of a Case of Hepato-Duodenostomy. A. D. Dunn and K. Connell (*J. Amer. Med. Assoc.*, 1921, **77,** 1093-6).—Following a cholecystectomy a patient developed an hepato-duodenal abcess communicating, on the one hand, with the cystic duct, on the other by a fistula with the duodenum; after numerous operative procedures, an anastomosis between the hepatic duct and the duodenum was effected, but at the same time a duodenal fistula appeared. Use was made of this for experiments on the bile flow, with especial reference to the Lyon technique (*Amer. J. Med. Sci.*, 1920, **160,** 522). Lyon believed that the sequence of pale bile (A), darker and more viscid bile (B), and dilute clear yellow bile (C), which followed the introduction of $MgSO_4$ into the duodenum, corresponded with the flow of bile from the common duct, gall-bladder, and hepatic ducts respectively; on this is based a scheme for diagnosis and treatment of biliary disease. The present authors, however, also got the A B C sequence in this patient. The B bile is richer in pigment, perhaps on account of some direct effect of Mg on the liver.—C. L. E.

3437. Cholin als Hormon der Darmbewegung. III. Die Beteiligung des Cholins an der Wirkung verschiedener organischer Säuren auf den Darm. IV. Über den Einfluss des Cholins auf die normale Magen-Darmbewegung. J. W. Le Heux (*Pflüger's Arch.*, 1921, **190,** 280, 301-10).—III. The effects on the isolated intestine of the salts of various organic acids is explained as being due to the formation from these organic acids of esters of choline from the choline present in the walls of the bowel with the

aid of a synthetic enzyme which is also there. The activity of these esters, compared with that of choline, as estimated by the contraction produced, is: Acetic ester, 1,000; propionic, 300; formic, 100; *n*-butyric, 40; isovalerianic, 15; benzoic, 2; succinic, 1. The Na salts of the acids have no effect if the intestine is first freed from choline by washing; in some cases readdition of choline or of the washings restores the effect. Atropine antagonises the effect of these salts, as it does that of choline. The possibility that the stimulating effect of sugars on the intestine may be due to intermediary formation of a pyruvic ester is discussed. IV. X-ray observations on cats to which 4 to 10 mg. choline HCl were given intravenously showed that the movements of the stomach and small intestine were accelerated.—C. L. E.

3438. Über Labwirkung des Duodenalsafts. M. Leist (*Wien. klin. Woch.*, 1921, **34,** 400-2).—The rennet effect of duodenal juice depends, first, on the pancreatic juice, and, secondly, on the duodenal secretion. An inactive enzyme of the former is activated by the latter secretion. This activation is intensified by addition of $CaCl_2$. Bile and pure cholic acid inhibit the action.—H. W.

3439. Action du sang de la veine porte sur la contractilité intestinale. C. Heymans (*J. de physiol. et de pathol. gén.*, 1921, **19,** 348-54).—Portal blood of a hirudinised animal does not increase the peristalsis of an isolated loop of intestine. It has sometimes a slight inhibitory effect like that of the general blood. The exciting substances present in extracts of the spleen, stomach, or intestine are not found in the venous blood of these organs. Hence these substances play no part in normal life.—W. M. B.

3440. The Mechanism of Absorption from the Intestine. S. Goldschmidt (*Physiol. Reviews*, 1921, **1,** 421-53).—Title given for information. The concluding sentence may be quoted: " That factors other than osmotic may be active in modifying the process (absorption) has been indicated. All the evidence points to their physico-chemical nature, and much useful research may still be expended before one need seek refuge in that last resort, ' vital cell activity.' "—J. A. H.

3441. Über die sekretionserregende Wirkung der salzsauren Aminosäuren auf das Pankreas. M. Arai (*Biochem. Zeit.*, 1921, **121,** 175-9).—The hydrochlorides of glycine, *d*-alanine, *d*-glutaminic acid, and glycyl glycine injected into the duodenum of a dog with a temporary pancreatic fistula cause a vigorous pancreatic secretion. Histidine monohydrochloride and glucosamine hydrochloride had no action. Intravenous or subcutaneous administration of any of these salts was without result. Adrenaline inhibits such a pancreatic secretion, but atropine is without action.—H. K.

3442. Über die Zusammensetzung der Leber, besonders ihren Eiweissgehalt in Krankheiten. G. Hoppe-Seyler (*Zeit. physiol. Chem.*, 1921, **116,** 67-95).—The total weight, dry substance, total protein, coagulable and non-coagulable nitrogen, fat content, and ash of livers taken post mortem from numerous subjects were determined. The results in general were such as might have been anticipated.—H. W. D.

3443. La nature de la bile blanche. A. Gosset, G. Loewy, and W. Mestrezat (*Presse méd.*, June 8, 1921; reprint, pp. 16).—In non-suppurative hydrops of the gall-bladder, produced by obliteration of the cystic duct, the so-called " white bile " which accumulates there contains neither bile salts nor pigments. The fluid is a transudation (" dialysate ") from the blood, plus variable amounts of mucin.—W. D. H.

3444. Le pouvoir lipasique des sucs pancreatique et intestinal. Influence de la bile. H. Roger and L. Binet (*Compt. rend. soc. biol.*, 1921, **85,** 648-9).—A confirmation of the previously known fact that the succus entericus collected during a period of fasting has no lipolytic activity. It is, however, activated by the addition of bile.—J. H. B.

FOODS

3445. Certain Pacific Coast Fishes. D. B. Dill (*J. Biol. Chem.*, 1921, **48,** 73-82).—Wide variations were found in the gross composition of individual fish of several species. These variations are frequently erratic, and have not been explained. No definite relation between the fat content of mackerel and the spawning season was traced, nor was there any evidence of a correlation between sex and chemical composition. The mackerel and related fish tended to show a high fat content during the summer and early autumn.—J. C. D.

3446. The California Sardine (Sardinia cærulla). D. B. Dill (*J. Biol. Chem.*, 1921, **48,** 93-103).—Considerable variation was found. The small sardines have a maximum fat content in the summer months, and the amount of fat tends to increase with the size of the fish. In the large sardines there is a marked seasonal variation, the maximum being in December and the minimum in May. No evidence was obtained that the reproductive organs draw to any great extent on the reserve fats. There are appreciable percentages of glycogen in the flesh of the sardine.—J. C. D.

3447. Absorption of Salt by Meat and Fish. S. Schmidt-Nielsen (*Tekn. Ukeblad*, 1920, **67,** 456).—When meat and fish are immersed in NaCl solution at ordinary temperature, they absorb considerable quantities of salt; but when they are placed in a mixture of ice and salt at $-5°$ to $-15°$, the absorption of salt is negligible at a depth of 2 mm. below the surface of the meat.—W. D. H. (*Chem. Abstr.*).

3448. Lævulinic Acid in Foods. L. Grünhut (*Zeit. Unters. Nahr. Gen.*, 1921, **41,** 261-79).—Lævulinic acid occurs in certain carbohydrate foods, and is usually accompanied by formic, acetic, and lactic acids; it may be identified by the red coloration which it yields with sodium nitroprusside in alkaline or acetic acid solution. A method for the estimation of lævulinic acid depends on its oxidation to acetic acid by means of potassium dichromate and sulphuric acid; the resulting acetic acid is distilled and titrated. Formic acid under the same conditions is oxidised to carbon dioxide. Many analytical details are given.—W. D. H. (*J. C. Soc.*).

3449. Über das Tryptophan. VI. Über den Tryptophangehalt einiger Nahrungsmittel und den Tryptophanbedarf des erwachsenen Menschen. O. Fürth and F. Lieben (*Biochem. Zeit.*, 1921, **122,** 58-85).—For the purpose of this investigation the tryptophane content of a large number of foodstuffs had to be determined colorimetrically (Voisenet's test). As the presence of a large proportion of fats or of starch interferes with the reaction, the proteins had to be isolated in some cases. On an average, the tryptophane content of nutritive proteins is between 2 and 2·4%. By making use of the large number of metabolic experiments described in the literature, the authors show that a man weighing 70 kilos consumes 2·5 to 3·2 grms. of tryptophane per diem, and no harm ensues if the tryptophane content is only one-half of this.—H. K.

3450. Über der Tryptophangehalt der wichtigsten Nahrungsmittel. T. Ide (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 166-207).—Full analyses are given in tables.—H. W.

3451. Sunflower Silage Digestion in Cattle and Sheep. R. E. Neidig, R. S. Snyder, and C. W. Hickman (*J. Agric. Res.*, 1921, **20,** 881-8).—The results recorded with full detail show results which are favourable, especially in sheep, as compared with corn silage.—W. D. H.

VITAMINS

3452. Vitamins and the Food Supply. A. Harden (*J. Soc. Chem. Ind.*, 1921, **40,** 79-82 R).—A general account of the subject.—W. D. H.

3453. Yeast and Food Utilisation by White Mice. R. R. Renshaw (*Amer. Nat.*, 1921, **45,** 73-8).—The addition of yeast (vitamin) increased growth.—W. D. H.

3454. Vitamins. (1) F. Bottazzi (*Bull. soc. hyg.*, 1921, **9,** 1-19); (2) F. Malengreau (*Rev. des. questions scient.*, 1921, **30,** 102-12); (3) E. Perrot and R. Lecoq (*Bull. soc. pharmacol.*, 1921, **28,** 177-91).—(1) A review of the vitamin question, dealing specially with Italian work. (2) A critical review. (3) Experiments on rats showing that some commercial flours are deficient in vitamins.—W. D. H. (*Chem. Abstr.*).

3455. Vitamin A in Fish Liver Oils. S. S. Zilva and J. C. Drummond (*Lancet*, 1921, ii., 753-4).—A brief preliminary account of a visit to the Norwegian factories of cod-liver oil. Off the Lofoten Islands (Jan. to April) mature cod are used; from May onwards the Finmarken coast is the chief fishing ground; the cod there are either spent or immature, and in the oil manufacture the livers used are mixed from cod, coal-fish (*Gadus virens*), and haddock. The following figures contrast the efficiency of various sources of vitamin A; they give in mg. the daily dose necessary to induce resumption of growth in rats: Coal-fish oil less than 2, crude cod-liver oil 2, haddock liver oil 10 to 15, a good medicinal oil sold in England 10 to 15, butter 500.—W. D. H.

3456. The Formation of Vitamin A in Living Plant Tissues. K. H. Coward and J. C. Drummond (*Biochem. J.*, 1921, **15,** 530-9).—Dried seeds vary in their content of vitamin A, but in general they are deficient. The amount is not increased during germination. Large amounts of vitamin A are formed in green leaves, but etiolated seedlings and leaves deficient in chlorophyll do not apparently synthesise this substance. From the results of water-culture experiments it would appear that the green plant synthesises the vitamin from inorganic sources. Marine algæ containing chlorophyll synthesise it; others which are differently adapted for photosynthesis (red weeds) are not so active. It is probable that the unicellular marine algæ form the primary source of the large reserves of vitamin A found in the fish livers. Lower plants devoid of pigments which play a rôle in carbon assimilation (mushroom) are almost completely deficient. Vitamin A in green leaves appears to be associated with the fat, and not with the protein. It may be obtained in an active condition in the unsaponifiable fraction from plant tissues.—J. C. D.

3457. I. The Value of Steam-distilled Palm-Kernel Oil as a Control Fat in Vitamin Feeding Experiments. II. Wheat Bran as a Source of Vitamins A and B. A. D. Stammers (*Biochem. J.*, 1921, **15,** 489-93).—Palm-kernel oil, steam distilled for a period of 3 or 4 hours at a temperature of 230° to 260° C., is entirely deprived of any vitamin A which it may originally have possessed. Bran appears to contain appreciable amounts of both vitamins.—J. C. D.

3458. Factors influencing the Value of Milk and Butter as Sources of Vitamin A. J. C. Drummond, K. H. Coward, and A. F. Watson (*Biochem. J.*, 1921, **15,** 540-52).—The diet of the cow is the chief cause of variations in the amount of vitamin A in milk. Season (apart from the consequent diet) and breed cause no marked variation. Colostrum is normally richer in the vitamin than the later milk. Butter is less potent as a source of A than the same amount of fat in the original milk. The loss is partly mechanical and partly due to destruction. Processes used in the making, storage, or preservation of butter which involve intimate exposure to air, especially at high temperatures, cause a loss of vitamin A by oxidation. Modern improvements in methods all tend towards lessening this loss. If the processes of rancidity involve oxidation changes in the butter, there will be a loss of the factor A, but considerable development of free acid may take place without loss of vitamin if oxidation is prevented.—J. C. D.

3459. Hunger Osteomalacia in Vienna. I. Relation to Diet. Elsie J. Dalyell and Harriette Chick. **II. Treatment.** E. Margaret Hume and E. Nierenstein (*Lancet*, 1921, ii., 842-9, 849-53).—I. This condition prevailed greatly among poor people of middle age and later years during the worst period of food deprivation. Mere dietetic treatment was beneficial. The addition of cereals and sugar caused little effect, but

fat proved beneficial. Cod-liver oil was most effective, and in bad cases the only cure; butter, oleo-margarine, and olive oil were also used, and the foregoing arranges them in descending order of effectiveness; this order corresponds to their richness in vitamin A. Relapses in winter would be explained by absence of green food then. But attempts to cure by green vegetables only (though rich in this vitamin) failed. The suggestion is that osteomalacia resembles rickets in being due to deficiency of vitamin A. II. This deals with 177 cases, and the outcome is that fat cures, not as fat, but because it is a carrier of the vitamin. The relation of this kind of osteomalacia to that of pregnancy is uncertain.—W. D. H.

3460. Nutrition on Fat-Free Diet. J. C. Drummond and Katharine H. Coward (*Lancet*, 1921, ii., 698-700).—Young rats were grown from weaning to maturity on diets as free as possible from neutral fats; they produced normal healthy litters. Vitamin A, prepared free from fat by a method to be described later, was given also. The death-rate in the rats so fed was higher than normal.—W. D. H.

3461. Vitamins. (1) Does Vitamin B stimulate Glands in a Manner Similar to Pilocarpine? (2) Relationship between Vitamin B and the Food Intake in the Dog. G. R. Cowgill (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 290-1).—(1) Extracts of rice polishings, wheat embyro, navy bean and yeast, and neutralised tomato juice, injected intravenously into dogs, did not produce a flow of saliva. (2) The administration of extracts of rice polishings, wheat embyro, and navy bean to dogs promoted appetite. —D. H. de S.

3462. The Growth-Promoting Properties of Milk and Dried Milk Preparations. J. M. Johnston (*Publ. Health Rep.*, U.S.A., 1921, **36,** 2044-57).—The process of drying skim milk by the spray process does not injure the water-soluble vitamin. In feeding albino rats with a basal mixture of purified foodstuffs plus milk of any kind, it is necessary to have $2\frac{1}{2}$ parts of milk to 1 of mixture to ensure normal growth. Excessive amounts of milk cause subnormal growth after a time.—J. A. H.

3463. Antineuritic Vitamin in Skim Milk Powder. J. M. Johnston and C. W. Hooper (*Publ. Health Rep.*, U.S.A., 1921, **36,** 2037-43).—Pigeons fed on mixtures of spray process skim milk powder with polished rice require 30% of the food in skim milk powder to avoid polyneuritis. This equals about 75 c.c. liquid milk daily.—J. A. H.

3464. Nachweis eines stofflichen Defizites im Gewebe an Avitaminose erkrankter Tiere. W. R. Hess and N. Takahashi (*Biochem. Zeit.*, 1921, **122,** 193-203).—A number of rats and mice were fed on a basal diet of rice. This was supplemented in some by muscle or pancreas preparations of (*a*) normal pigeons and (*b*) of pigeons suffering from experimental beri-beri. The life period, the weight curve, and in rats the time of onset of xerophthalmia were observed, and indicate that, especially in the case of muscular tissue of pigeons suffering from beri-beri, there is a nutritive deficit not observed with normal muscle.—H. K.

3465. The Failure of Rats to develop Rickets on a Diet Deficient in Vitamin A. A. F. Hess, G. F. McCann, and A. M. Pappenheimer (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 266-7).—Lack of fat-soluble vitamin in a dietary which is otherwise complete does not lead to the development of rachitic lesions in rats.—D. H. de S.

3466. Experimental Rickets.—IV. and V. E. V. McCollum, N. Simmonds, P. G. Shipley, and E. A. Park (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 275-80).—IV. A diet deficient in Ca induced growth in young rats when the diet contained cod-liver oil, but not when the cod-liver oil was replaced by butter fat. V. A diet with a low content of antirachitic organic factors and a low P content gives rise to rickets, but deficiency of the organic factor alone does not produce rickets. If the P content is raised, the rachitic condition does not develop, nor does it develop if the quantities

of both Ca and P are low. Butter fat is feeble, cod-liver oil powerful, in antirachitic properties.—D. H. de S.

3467. (1) The Cure of Infantile Rickets by Sunlight. (2) An Interpretation of the Seasonal Variation of Rickets. A. F. Hess and L. J. Unger (*J. Amer. Med. Assoc.*, 1921, **77,** 39; *Amer. J. Dis. Children.*, 1921, **22,** 186-92).—(1) By exposure to sunlight, or (2) to ultraviolet rays, even in the winter, there is rapid improvement in the calcification of the bones in rachitic infants. Milk from pasture-fed cows (summer milk) failed to prevent the development or to decrease the incidence of rickets during the winter in infants not so treated. The importance of these observations is obvious. —C. L. E.

3468. The Cure of Infantile Rickets by Artificial Light and by Sunlight. A. F. Hess and L. G. Unger (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 298).—The authors, as the result of observations on treatment, conclude that the seasonal incidence of rickets is due to the seasonal variation of sunlight; that many cases of rickets are due to defective hygiene rather than to dietary errors; that sunlight should be used to prevent and to cure infantile rickets; and that in metabolism studies, both on animals and on man, the influence of sunlight must be noted and taken into account.—D. H. de S.

3469. Diffusible Calcium in Normal, Rachitic, and Experimental Tetany Blood. L. von Meysenbug (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 270-2).—There is no change in the percentage of diffusible serum calcium in human rickets, or in experimental dog tetany.—D. H. de S.

3470. Various Modifications in Diet producing Rickets in Rats. A. M. Pappenheimer, G. F. McCann, T. F. Zucker, and A. F. Hess (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 267-70).—The authors' results confirm those of Sherman and Pappenheimer (see Abstract No. 2203, Vol. VI., p. 319). They find, in addition, that the protection afforded by potassium phosphate is due to the phosphate, and not to the potassium; that absence of fat-soluble vitamin from the diet does not produce rickets, nor does its presence prevent it; that their results, after addition of yeast or casein to the rickets-producing diet, are inconclusive; and that the addition of both casein and yeast to the diet affords complete protection.—D. H. de S.

3471. Rickets in Rats. V. Korenchevsky (*Brit. Med. J.*, 1921, ii., 547-50).—The results obtained agree in general with those of Mellanby, McCollum, and others. Confinement in small cages does not evoke rickets, nor does the introduction of live cultures of intestinal bacteria with the food or subcutaneously. Deficiency of the diet in Ca or in vitamin A produces changes resembling rickets, but the changes typical of rickets occur most readily and most frequently in rats on a diet deficient in both. Vitamin A has a relation to the metabolism of Ca in the organism.—D. H. de S.

For rickets see also under Metabolism.—Ed.

3472. Dietary Factors influencing Calcium Assimilation—I. E. B. Hart, H. Steenbock, and C. A. Hoppert (*J. Biol. Chem.*, 1921, **48,** 33-49).—Experiments with goats show that there is a factor present in fresh green oats which increases the amount of Ca assimilated. The dry oat straw in comparison did not show this property to the same degree, but oat hay dried out of direct sunlight retained its potency. Orange juice and fresh or dried cabbage showed no such effect, so that the vitamin C is eliminated as being the factor responsible. Cod-liver oil in relatively small doses consistently changed negative Ca balances to positive, and it would appear that the same factor operates in this case as in the experiments with green oats.—J. C. D.

3473. The Antiscorbutic Properties of Concentrated Fruit Juices—IV. A. Harden and R. Robison (*Biochem. J.*, 1921, **15,** 521-2).—A loss of about 50% of the original potency was shown by a sample of concentrated orange juice stored at 29° C. for 14 months.—J. C. D.

3474. Zur Barlow-Frage. Bedeutung der Hitzewirkung auf die Vitamine. Beitrag zur Frage der Nahrungskonzentration. E. Nobel (*Zeit. f. Kinderheilk.*, 1921, **28**, 348-70).—Even milk which has been boiled down for as much as an hour contains sufficient antiscorbutic vitamin to be of benefit in cases of Barlow's disease. The vitamin in question seems not to be so thermolabile as has been supposed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3475. Sur une réaction colorée commune aux extraits antiscorbutique et à l'hydroquinone. N. Bezssonoff (*Compt. rend.*, 1921, **173**, 466-8).—A modification of the Folin-Denis phenol reagent has been found to give a slate-gray turning to blue coloration with different juices which are known to possess an antiscorbutic power. This coloration is not produced with extracts destitute of antiscorbutic properties. Causes which diminish the antiscorbutic power of a juice weaken the reaction. It is supposed that possibly the reaction may be due to a polyphenol. Among all the compound phenols studied, hydroquinone alone gives the same reaction as the juices containing the antiscorbutic vitamin.—H. W.

METABOLISM

3476. Metabolism and Growth from Birth to Puberty. F. G. Benedict and F. B. Talbot (*Publ. Carnegie Inst.*, Washington, 1921, No. 302, pp. 213).—The relation of basal metabolism to weight, height, food, surface area, sex, etc., have been exhaustively investigated, and results of considerable statistical value are given. Detailed treatises of this nature are obviously unsuited for abstraction, but those interested in the problems of basal metabolism will find the work invaluable.—C. L. E.

3477. The Physiological Cost of Muscular Work. A. D. Waller and G. de Decker (*Brit. Med. J.*, 1921, ii., 627-30).—This is a reply to objections raised in recent communications. The short period (30 seconds) during which expired air is collected is necessary in order that the worker may not be interrupted for too long in his exertions, but in longer periods observed by others the figures obtained often widely diverge. The food factor is considered to be negligible, and even the neglect of the respiratory quotient, if this is taken at an average value, does not introduce serious error. All of these points have been considered in reply to former objections. What the authors claim is that their "short" method gives the essential datum. They have now arranged to carry out parallel investigations by it and the "long" method, and will publish the results.—W. D. H.

3478. Nutrition in Vienna—II. Madge R. Gribbon, D. N. Paton, Margaret Ferguson, and Annabel M. T. Tully (*Lancet*, 1921, ii., 747-50; see Abstract No. 907, Vol. VI., p. 139).—Further valuable statistics dealing specially with the under-nutrition of children. No evidence of an increase of rickets was found. The gross intake per man per day was about 2,000 cal.; on this, life and a certain amount of activity were maintained; doubtless, as Benedict found, under-nutrition lessens the basal metabolism.—W. D. H..

3479. The Utilisation of Calcium Compounds in Nutrition. I. and II. The Metabolism of Calcium Compounds by Growing Swine. III. and IV. Effects of Mineral Supplements on the Development of Swine. V. Palatability of Salt Preparations to Swine, Cattle, and Horses. VI. Alkali Reserve of Swine as affected by Cereal Feeding and Mineral Supplements. E. B. Forbes, J. O. Halverson, L. E. Morgan, J. A. Schulz, E. B. Wells, C. H. Hunt, and A. R. Winter (*Ohio Agric. Exp. Stat. Bull.*, 1921, No. 347, pp. 99).—I. and II. A metabolism study of growing swine on cereal rations as affected by added pulverised limestone, precipitated bone flour, raw rock phosphate floats, "special" steamed bone flour, precipitated calcium carbonate, and various mixtures

of these. On corn, linseed, oilmeal, and wheat middlings with NaCl there is loss of Ca, subnormal retention of Mg and P, and acidosis. Increased intake of Ca causes retention of Ca, Mg, and P. Addition of NaCl causes retention of both Na and Cl. All supplements cause retention of Cl and P, and (except precipitated bone flour) cause also lowered urinary acidity and ammonia; the bone flour increased these. The most efficient form of Ca is $CaCO_3$ and precipitated bone flour. The metabolism of sodium is independent of that of chlorine, and the former is excreted in greater fæcal than urinary amount. III. and IV. The basal ration was given with similar supplementary rations; whitening and also marl were added to certain diets. The general development is not affected, but the skeleton is, as to ash per unit volume, breaking strength, and composition. Steamed bone flour and $CaCO_3$ produce dense, strong bones; rock phosphate, bones not so strong as on the basal diet only. This last is the main point of the research. The hardest bones contained a maximum percentage of Ca, CO_2, and ash, and minimum Mg. The softest bones contained maximum Mg and P, and minimum Ca and CO_2. The mineral substance of bone is a mixture of phosphate and carbonate, from which the latter can be withdrawn as part of the alkali reserve of the body. V. Pigs like coarse, gritty material, and avoid dust. Steamed bone and packer's bone seem to be most acceptable to cattle, while horses avoid the latter, but will take precipitated and steamed bone. VI. Feeding on potentially basic precipitated $CaCO_3$ increases the alkali reserve, while potentially acid phosphate lowers it. The bulletin is a mass of analytical data, and the above represent only the outline of the main conclusions.—J. A. H.

3480. Metabolism of Rickets. L. Findlay, D. N. Paton, and J. S. Sharpe (*Quart. J. Med.*, 1921, **14**, 352-97).—The importance of deranged calcium metabolism as a factor in rickets seems to have been exaggerated by some former writers. References to literature are given throughout. A calcium poor diet in dogs causes osteoporosis, not true rickets. In experimental rickets (dog) the tissues other than bone are not deficient in Ca; this includes the blood. No evidence that rickets is due to a deficient Ca supply to the bones was found. The custom to study Ca metabolism by examination of fæces, etc., for short periods is deprecated. The Ca of human milk is better utilised than that of cow's milk; increase of milk fat does not raise Ca utilisation in normal or rachitic children; the fatty acids are rapidly absorbed, and only $\frac{1}{10}$ of the total Ca is combined as soap. When fat digestion and absorption are lessened, as in obstruction of bile ducts, the proportion of Ca as soap in fæces is increased, and diminished use of Ca is then probable. The utilisation of Ca (difference of intake and output in fæces) is in health and rickets fairly proportional to the intake, but in rickets the parallelism is not so strict. Age is a factor; the percentage utilisation increases up to 13 years, but urinary output also rises, and so increased retention is not necessarily proved. The Ca percentage in dry fæces is nearly constant in each individual. In the more progressive stages of rickets, utilisation and retention of Ca may be below normal, but in other cases, especially of some duration, the Ca retention may be above normal for that age; this probably indicates the stage of recovery. Analytical methods are fully described, and the data of experiments and of clinical cases are set out in appendices.—W. D. H.

3481. Zur Kenntnis des Mineralstoffhaushaltes. V. Über die Wirkung des Karlsbader Wassers auf den Anionenbestand des Kaninchens. E. Stransky (*Biochem. Zeit.*, 1921, **122**, 1-33).—Previous papers showed that the content and balance of cations in the rabbit's organism could be modified by varying the food or introducing salts into the drinking water. The author now examines the effect on the balance of anions, chloride, sulphate, and phosphate, produced by drinking Carlsbad water and an artificially prepared water containing only sulphanion. The sulphate of Carlsbad water

has no influence on the chloride content of the rabbit's organism, but causes large amounts of phosphates to be retained. The same applies to the sulphate water.—H. K.

3482. Chloride Metabolism.—I., II., III. F. Boenheim (*Zeit. exp. Med.*, 1921, **12,** 295, 302, 317-30).—I. The body is stated to contain 100 gm. of NaCl, of which 30 are in the blood; the figure varies in different pathological conditions, of which details are given. II. The relation of salt to gastric ulcer is discussed, but a rise of HCl only produces ulcer when there is predisposition of the stomach. III. This treats of results of injecting extracts of endocrine organs. Some appear to raise, others to lower the Cl of the blood; the majority stimulate Ca metabolism.—W. D. H. (*Chem. Abstr.*).

3483. La régulation de l'eau. M. Ide (*Rev. méd. de Louvain*, 1921, No. 10, 139-46).—Revue critique.—E. Z.

3484. Über den Nucleinstoffwechsel. XI. Über die Einwirkung menschlichen Leberextraktes auf Nucleoside (Guanosin, Adenosin, Xanthosin). S. J. Thannhauser and B. Ottenstein (*Zeit. physiol. Chem.*, 1921, **114,** 17-27).—Solutions of guanosine, adenosine, and xanthosine were acted upon by aqueous extracts of human liver with free access of air. After short periods free xanthine and uric acid could be isolated, but in no case could free amino-purines (adenine or guanine) be found. It was not possible to detect any oxy-purine glucosides. The authors conclude that concurrently with deaminisation decomposition of the nucleoside compounds occurs.—H. W. D.

3485. Über den Nucleinstoffwechsel. XII. Die Hydrolyse der Thymusnucleinsäure mit Pikrinsäure. Über die Zusammensetzung der Thyminsäure. S. J. Thannhauser and B. Ottenstein (*Zeit. physiol. Chem.*, 1921, **114,** 39-50).—On hydrolysis of thymus nucleic acid with boiling aqueous picric acid the authors isolated, as brucine salts, cytosine hexose mono- and diphosphoric acids, thymine hexose mono- and diphosphoric acids, and 2 other phosphoric acid complexes of undetermined constitution. The authors criticise Levene and Jacobs's view of the structure of the above diphosphoric acids.—H. W. D. (*J. C. Soc.*).

3486. Die spezifische Drehung des aktiven phenyl-γ-oxybuttersauren Natriums und die Reduktion der Benzoylpropionsäure im Körper. H. Thierfelder and E. Schempp (*Zeit. physiol. Chem.*, 1921, **114,** 94-100).—The phenyl-γ-hydroxybutyric acid excreted in the urine after administration of benzoyl propionic acid is shown to be the pure *lævo*-rotary acid. Racemic phenyl-γ-hydroxybutyric acid has been resolved by way of the brucine salts.—H. W. D.

3487. Der Doppelstickstoff, ein Diagnostikum für endogenen Eiweisszerfall, insbesondere für okkulte eitrige Prozesse. A. Hahn (*Biochem. Zeit.*, 1921, **121,** 262-72).—The difference between the N content of serum after removal of proteins and breakdown products by precipitation with phosphotungstic acid, and the N content of serum after removal of proteins alone by trichloracetic acid, gives a measure of the protein degradation products present. This value the author terms "Doppelstickstoff" (D.N.). It shows considerable variation in different diseases.—H. K.

3488. Über die Methylierung im tierischen Organismus—I. and II. M. Tomita (*Biochem. Zeit.*, 1921, **116,** 48-54, 55-8).—I. Contrary to the findings of Abderhalden and co-workers (*Zeit. physiol. Chem.*, **59,** 32; **62,** 133), rabbits on various diets can convert pyridine to a small extent into methyl pyridine, which was isolated as the platinum salt. II. Extirpation of the spleen or pancreas in frogs has no influence on the production of methyl pyridine, whilst removal of the liver completely inhibits it. In dogs, removal of the spleen or testicles has no effect. The methylation is assumed to take place in the liver, but experiments with isolated organs have not, so far, been successful.—H. K.

3489. Pyrrole and Melanuria—IV. P. Saccardi (*Gazetta*, 1921, **51,** ii., 108-12).—2 : 5-Dimethyl pyrrole *in vitro* does not yield melanogen, but when introduced hypo-

dermically into the animal organism it is demethylated and probably carboxylated by oxidation of methyl groups. Probably the pyrrole ring is united by carboxyl groups with the rest of the melanogen molecule. It is readily ingested, and excreted slowly; it makes the urine slightly melanotic.—W. D. H. (*J. C. Soc.*).

3490. Über den Stoffwechsel der Amphibienlarven. J. K. Parnas and Z. Krasinska (*Biochem. Zeit.*, 1921, **116**, 108-37).—The oxygen consumption of the larvæ of frogs was determined from the moment of fertilisation and on through the various early stages of growth. The influence of the proportion of oxygen and of the presence of urethane was also investigated. In general, over the whole period of growth there is a progressive increase in the consumption of oxygen, although over short periods of development of the larvæ the oxygen consumption may be constant. The paper is fully illustrated by graphs and models.—H. K.

SUGAR AND DIABETES

3491. Über die Beziehung zwischen dem Blutzuckergehalt und der Wärmeregulation. Y. Kuno (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **22**, 165-88).—In 4 hours after piqûre in rabbits the blood-sugar reaches a maximum; it then sinks, especially at a high external temperature; if a high body temperature is produced by cerebral injury, the sugar increases slightly, but when the temperature is lowered by antipyrin it rises greatly. Antipyrin alone has no effect on the sugar content, but produces hyperglycæmia when the temperature is subnormal. These experiments, with others on fever caused by coli bacteria, lead to the conclusion that elevation of body temperature leads to a fall of blood-sugar.—W. D. H.

3492. The Influence of Hypertonic Sodium and Calcium Chloride on the Blood-Sugar. P. Schenk (*Zeit. exp. Med.* 1921, **12**, 269-74).—Intravenous infusion of 100 to 300 c.c. of 10% NaCl reduces the blood-sugar in man for 3 to 4 hours. In the rabbit there is a disturbance of cation balance resulting in hyperglycæmia. Diuresis is reduced, particularly when large quantities of fluid are given at the same time by mouth, but rises within the next 2 days to 800 to 1,000 c.c. Glycosuria never occurs. Intravenous $CaCl_2$ injections reduce blood-sugar in a degree varying with the amount of salt injected. The degree to which the permeability of the kidneys to sugar can be influenced by the injection of large doses of $CaCl_2$ cannot be definitely determined. Apparently there is a decrease in permeability, certainly no increase. On the other hand, phloridzin diabetes in man can be overcome by administration of $CaCl_2$. The antidiuretic action of large doses of pituitary extracts subcutaneously is increased by preliminary injection of $CaCl_2$.—W. D. H. (*Chem. Abstr.*).

3493. Normal Sugar Content of the Blood. P. J. Cammidge, J. A. C. Forsyth, and H. A. Howard (*Brit. Med. J.*, 1921, ii., 586-90).—As the result of observations on the blood-sugar of man and animals, the authors hold the view that the liver contains a diastatic ferment the action of which is reversible. In the fasting state the glycogenolytic activities of this enzyme are largely inhibited by an antiferment formed by the pancreas, the impermeability of the resting liver cells to NaCl, and the reaction of the blood and liver cells. After the taking of food, when acid enters the duodenum the secretion formed stimulates the liver cells to produce bile, thus permitting the entrance of NaCl, which activates the diastatic ferment. At the same time it causes a secretion of alkaline pancreatic juice which combines with the acid gastric contents, forming acid salts and NaCl, which pass to the liver and increase the activity of the diastatic ferment. It also interferes with the formation of the internal secretion of the pancreas, thus diminishing its inhibitory effect on glycogenolysis in the liver.

Carbohydrates reaching the liver from the intestine or formed from proteins in the liver are converted into glycogen by the diastatic ferment, the efficiency of the process depending upon the extent to which the glycogenolytic action of the enzyme is inhibited by the internal secretion of the pancreas. Unless the power of glycogen formation possessed by the liver is exceeded, sugar as such, or formed from starch in the intestine, does not pass into the general circulation or play any direct part in the rise of blood-sugar following feeding.—D. H. de S.

3494. Beitrag zur Frage der Beeinflussung des Blutzuckers durch das Ovarium. O. Hürzeler (*Monatssch. f. Geburtsh. u. Gynäkol.*, 1921, **54**, 215-9).—For a certain period after ovariotomy hyperglycæmia was found to be produced in rabbits by a dose of adrenaline too small to influence the blood-sugar concentration in the normal animal. This hypersensitivity to adrenaline had disappeared 3 months after the operation.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3495. Über den Blutzuckergehalt bei der Addisonschen Krankeit und bei adrenalektomierten Tieren. K. Sakagachi, I. Hayashi, and K. Katayama (*Mitt. a. d. med. Fak. Univ.*, Tokio, 1919, **23**, 33-61).—Hypoglycæmia is not seen in Addison's disease (5 cases). Adrenal extirpation does not produce it till the animal is moribund (rabbit). The rise of blood-sugar after carbohydrate food is normal in Addison's disease. Phloridzin produces glycosuria in adrenalectomised rabbits.—W. D. H.

3496. Glycosuric Action of Atropine. A. Rossi (*Atti ist. Veneto*, 1919, **78**, 354-7).—Atropine injected into rabbits after abundant feeding in doses of 0·005 to 0·015 g. per kg. produced no glycosuria, while injections in well-fed dogs in doses of 0·00307 to 0·00571 g. per kg. produced glycosuria in 6 cases out of 10. Large individual differences were noted. The action is attributed to a paralysing effect on the gluco-inhibitory nerves, and particularly on the vagus. The failure with rabbits is believed to be due to the strong tolerance of these animals for atropine, and to a probable lack of tone in the branch of the vagus which controls hepatic glycogenesis.—W. D. H. (*Chem. Abstr.*).

3497. The Diastatic Activity of the Blood in Experimental Hyperglycæmia. H. T. Karsner, H. L. Koeckert, and S. A. Wahl (*J. Exp. Med.*, 1921, **34**, 349-63).—Blood diastatic activity is increased by morphine, asphyxia, pancreatectomy, slightly by ether and by severe hæmorrhage; unaffected by piqûre, phloridzin, uranium, adrenal, or by change of diet. It is not proportional to the blood-sugar content.—C. L. E.

3498. The Sugar Content of Secretion and Effusion. K. Hiruma (*Iji Shinbun* [*Med. News*], 1921, No. 1069).—Secretions have higher glucose content than effusions, and were in one case of the order of 0·114 and 0·067% respectively. These amounts were unaffected by pyrexial conditions.—J. A. H. (*Jap. Med. World*).

3499. Über den Blutzucker und die Zuckerausscheidung bei toxischer Nephritis. R. Kuga (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **24**, 419-547).—The experiments on rabbits described will mainly interest clinicians. If uranium nephritis is produced, the sugar in the blood rises slowly as the urine lessens, and, finally, glycosuria occurs. The cause of the rise is discussed at length, and the author sought to elucidate his results by numerous other experiments, such as injection of adrenaline. The whole is a mass of undigested experimental work, and the author seems as much at sea as the reader.—W. D. H.

3500. Zur Kenntnis der Stoffwechsels. I. Schilddruse und Kohlenhydratstoffwechsel. II. Chinin und Kohlenhydratstoffwechsel. N. Sekita (*Mitt a. d. med. Fak. k. Univ.*, Tokio, 1920, **24**, 325-418).—I. Thyroidectomy in rabbits does not affect the blood-sugar (rabbits); injection of adrenaline raises it, whether the thyroid is present or not, but removal lowers body temperature and lowers the excitability of the "vegetative" nervous system. Hyperglycæmia leads to glycosuria; adrenaline and lymphagogues are regarded as antagonistic. Phenol sulphonephthalein (intravenous) appears

in the urine 3 hours after injection; thyroid extirpation does not alter this or the amount of urine. After subcutaneous injection the excretion is slower in both sets of rabbits. The thyroid does not affect the assimilation limit of glucose (5 to 10 gm. per kilo in rabbits). The higher the blood-sugar the more marked is glycolysis. Athyreosis has no effect, but hyperthyroidism and adrenaline injection inhibit glycolysis in varying degrees. Pancreatic extract and thyroid extract hasten liver glycolysis. II. Quinine increases various forms of glycosuria, partly by increasing the tone of the "sugar centre," partly by stimulating the liver cells.—W. D. H.

3501. Untersuchungen an Körperflussigkeiten. IV. Der Zustand des Zuckers im Serum. S. Rusznyák and G. Hetényi (*Biochem. Zeit.*, 1921, **121,** 125-6).—The reducing substances in serum are greater in amount than in the ultra-filtrate, but after fermenting with yeast there is very little difference between the residual reducing substances in the serum and in the ultra-filtrate.—H. K.

3502. Über das Vorkommen von Organextract-Glykosurien. P. Schenk (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 208-13).—Experimental glycosuria could not be produced in dogs by intramuscular injections of a number of extracts of different endocrine glands.—H. W.

3503. Zur Frage der Nervösen Beeinflussung des Purinstoffwechsels. P. Dresel and H. Ullmann (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 214-22).—Caffeine diuretin produces excretion of uric acid and allantoin; the stimulus starts from the central nervous system, and passes by the splanchnic nerves to the liver. The mechanism of the mobilisation of purines is the same as in piqûre glycosuria.—H. W.

3504. Über den Blutdruck bei Diabetes mellitus. K. Hitzenberger (*Wien. Arch. f. innere Med.*, 1921, **11,** 461-6).— The blood-pressure is usually low in young persons, and high with older patients.—H. W.

3505. Glycuronic Acid in Diabetic Blood. E. Diebschlag (*Virchow's Arch.*, 1921, **230,** 179-90).—The colour reaction with naphtho-resorcinol is not conclusive for estimating whether glycuronic acid is increased in human diabetes, for other unknown substances in blood give the reaction. Together with the orcinol and phloroglucinol methods it serves as a delicate test.—W. D. H. (*Chem. Abstr.*).

3506. Über die analytische Erfassung und Differenzierung von Acetaldehyd, Aldol und Glyoxylsäure, sowie deren Vorkommen im Diabetikerharn. R. Fricke (*Zeit. physiol. Chem.*, 1921, **116,** 129-49).—Making use of the properties of the condensation products of the above substances with dimethyl hydroresorcinol (Dimedon), it is possible to separate acetaldehyde and furfurol from aldol, crotonic aldehyde, and glyoxylic acid. In severe diabetes very minute quantities of aldol may occur in the urine, but in the cases investigated it did not occur in significant quantity. The presence of acetaldehyde in diabetic urine was confirmed, but no glyoxylic acid was found.—H. W. D.

KIDNEY AND URINE

3507. Capillary Blood-Pressure Measurement and the Glomerular Filtration Theory. L. Hill and J. McQueen (*Brit. J. Exp. Pathol.*, 1921, **2,** 205-13).—The paper deals with Cushny's theory of the secretion of urine, and evidence is brought forward to show that pressure in the glomerular capillaries is a low one, and that physiological permeation—not filtration—controls the passage of fluid through the glomeruli. Observations on the circulation in the frog's glomeruli are detailed, and support these conclusions, which are also borne out by experiments of Hamburger, which demonstrate the selective action of the epithelium covering the glomeruli.—*Author's Abstract.*

I doubt if the word "selective" in the last line would meet with Professor Hamburger's approval.—W. D. H.

3508. Bemerkungen zu den Mitteilungen von R. Kochmann und M. Kochmann. E. Salkowski (*Biochem. Zeit.*, 1921, **116,** 191-4).—The author draws attention to a paper by himself (*Zeit. physiol. Chem.*, 1913, **83,** 165), and to an unsuccessful attempt to occlude the urinary canals of the rabbit by injections at different sites of sodium sulphate and strontium nitrate. Rabbit's urine has the capacity of inhibiting the deposition of strontium sulphate, which only appears on acidifying.—H. K.

3509. Nierenfunktion—I. and II. K. Tamura and M. Miwa (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **23,** 318, 349-71).—Various forms of diuresis (Na_2SO_4, caffeine, etc.) produce no increase of oxygen usage in the kidney, nor increase of blood-flow (rabbits). The only exception found was that of diuretin, which increases the oxygen usage. The work of previous workers is discussed. The general view taken is that diuresis is due to increase of permeability in the kidney cells. The secretion of urine demands no expenditure of energy, as in true glands, but is a passive physical process. —W. D. H.

3510. Studi sul ricambio materiale in alta montagna e in pianura. II. L'eliminazione dell' anidride carbonica per i reni. A. Costantino (*Arch. di Sc. Biol.*, 1921, **2,** 147-60).—In guinea-pigs kept at reduced atmospheric pressure, the CO_2 eliminated by the kidneys rises during a first period from a minimum in the first 24 hours to a maximum at the end of the 3rd or 4th day. A fall of P_2O_5 excretion and an increase in the rate of respiration are also observed. In a second phase the quantity of CO_2 eliminated and the concentration of the [OH'] gradually diminish, while the P_2O_5 and NH_3 increase, this last reaching amounts greater than in normal urine.—C. d. F.

3511. Uric Acid, Urea, and Creatinine in the Blood in Renal Disease. C. K. Watanabe (*Kyoto Igaku Zasshi*, 1918, **15,** No. 1, 72-84); *Jap. Med. Lit.*, 1921, **6,** 2).—The creatinine is the most important single factor in prognosis; an almost certain fatal termination is indicated by 5 mg. or more of creatinine per 100 c.c. of blood. Uræmia is indicated if the blood contains 4 mg. of creatinine and 80 mg. of urea per 100 c.c. A high urea content combined with a low creatinine content is of doubtful significance. Estimation of uric acid alone is of but little value; a high uric acid content is not diagnostic of gout.—W. D. H. (*Chem. Abstr.*).

3512. Influence of Alkaline Reaction on Nephritis. M. Hara (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **25,** 1-23).—In rabbits acid urine produced by barley diet lessens the resistance of the kidneys to cantharidin, but alkaline urine ("kara" diet) protects. —W. D. H.

3513. The Relation of Acid Base Equilibrium in the Body to Excretion of Phosphorus and Calcium. T. F. Zucker (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 272-5).—In man the urinary P and Ca are progressively diminished by the administration of $NaHCO_3$, and progressively increased by the administration of HCl. Under normal conditions 57% P and 28·7% of Ca are excreted in the urine, the rest being excreted in the fæces. When $NaHCO_3$ is administered, the figures for the urine are 44% of P and 22% of Ca. The administration of HCl causes a reversal of this change, more Ca and P appearing on the urine.—D. H. de S.

3514. Sur la porphyrinurie experimentale—I., II. and III. E. Grynfeltt and Mlle. R. Lafont; R. Lafont and F. Portes (*Bull. soc. des sci. méd. de Montpelier*, 1921, 2, 388-90, 424-5, 425-6).—I. It is well known that sulphonal may cause hæmatoporphyrinuria in man. The same is true for rabbits. The chondriomes of the liver cells become granular (as in Fiessinger's "condensation granuleuse acidophile"). The nucleus is unaffected. II. Large doses are necessary to produce the effect in guinea-pigs, and the amount of hæmatoporphyrin in the urine is very small even then.

III. In the rabbit's spleen sulphonal causes the lymphoid nodules to increase in size. The red pulp increases in volume slightly; this is chiefly due to increased liberation of lymphocytes; the phagocytic activity of the cells on red corpuscles increases.—W. D. H.

3515. A propos de la constante uréo-sécretoire d'Ambard. M. Herman (*Bull. de l'acad. roy. méd. de Belgique*, 1921, 5ème ser., **1**, 343-6).—L'auteur propose de remplacer la constante d'Ambard par la formule $k = \frac{D\sqrt{C}}{5\ Ur^2}$, dans laquelle Ur représente la teneur du sang en urée, D le nombre de grammes d'urée éliminés en 24 heures et C la concentration de l'urée dans l'urine. Pour des valeurs proches de 0·07 pour K, on aura des valeurs de k proches de 204. Lorsque la constante d'Ambard devient mauvaise la valeur de k diminue. On peut simplifier la formule d'Ambard en l'écrivant $K = \frac{Ur}{\sqrt{D\ 25}}$ et la nouvelle formule proposée devient $k = \frac{D\ 25}{Ur^2}$. On abrège les calculs en se servant d'un tableau permettant de calculer D 25 en fonction de D et d'un outre tableau donnant les valeurs de $\sqrt{D\ 25}$ en fonction de D 25.—E. Z.

3516. Über die Bestimmung der Purinebasen im Harn. H. Steudel and S. S. Chou (*Zeit. physiol. Chem.*, 1921, **116**, 223-5).—In Krüger's method for determining the purine N of urine it is found that the purine fraction is contaminated with ammonia. Unless this is removed by distillation with barium carbonate errors as great as 34% may be encountered.—H. W. D.

3517. Über das Wesen der Ehrlichschen Diazoreaktion—I. and II. L. Hermanns and P. Sachs (*Zeit. physiol. Chem.*, 1921, **114**, 78-87, 88-93).—2 methods are described for the separation from urine of the substances which give the diazo-reaction. The first consists in combining these substances with dichlorodiazobenzene chloride and extracting the dyes formed with a mixture of ether and pyridine; the second in the direct extraction of the substances with ether from the concentrated acidified urine. By the first method, a dye containing sulphur was obtained; by the second, a reducing substance which gave both the diazo- and aldehyde reactions. An azo-dye ($C_{16}H_{11}O_3N_3Cl_2$) was isolated from the urine of a case of carcinoma of the liver. The coupling substance present in the urine is regarded as 4-hydroxyindole-3-acetic acid, which the authors consider to be a degradation product of tryptophane.—H. W. D. (*J. C. Soc.*).

3518. Sul significato clinico e biologico della proteinuria di Bence-Jones. F. Micheli (*Hœmatologica*, 1921, **2**, 1-46).—In a fatal case of lympho-sarcoma of the colon, a remarkable degree of Bence-Jones's proteinuria occurred. There were no lesions of the bone-marrow. The Bence-Jones proteose was found in urine, blood, and serous effusions. It is not regarded as a product of regression but as a true protein similar to that of the blood-serum. Its antigenic properties are described.—C. d. F.

3519. Urinary Changes after a Long Swim. Sata (*Chuo Igak. Zasshi*, 1918, No. 274, 347; *Jap. Med. Lit.*, 1921, **6**, 11.—After a swim of 5 knots the urine contained albumin, which persisted for a period of 24 hours.—W. D. H. (*Chem. Abstr.*).

3520. Precipitins to Egg-White in the Urine of New-Born Infants. C. G. Grulee and B. E. Bonar (*Amer. J. Dis. Child.*, 1921, **21**, 89-95).—New-born infants received a 20% solution of egg-white between feedings in place of plain water. In all, 136 specimens of urine were examined. Of these, 33 gave a positive reaction. The first occurred on the 4th day; no reaction was obtained after the 11th.—W. D. H. (*Chem. Abstr.*).

ENDOCRINE SYSTEM

3521. Physiologie der Drüsen. XLVI. Die Wirkung des Schilddrüsenhormons bei gestörtem Kohlehydratstoffwechsel durch Phlorhizindiabetes. L. Asher and W. Horrisberger (*Biochem. Zeit.*, 1921, **121,** 64-75).—Phloridzinised rats show an increased basal metabolism on administration of desiccated thyroid.—H. K.

3522. Über die chemische Wärmeregulation Schilddrüsenloser Ratten. F. Hildebrandt (*Arch. exp. Path. Pharm.*, 1921, **90,** 330-5).—The thyroid gland plays no part in heat regulation. Rats deprived of thyroids behave exactly as do normal rats (as regards O_2 consumption and CO_2 production) in response to lowered external temperature.—J. H. B.

3523. The Influence of Thyroid Products on the Production of Myocardial Necrosis. E. W. Goodpasture (*J. Exp. Med.*, 1921, **34,** 407-23).—Myocardial necrosis resulted when large doses of thyroid gland or of thyroxin were given to rabbits, especially if the animals had also been chloroformed.—C. L. E.

3524. Über den Einfluss spezifisch gebauter Jodverbindungen auf die Metamorphose von Froschlarven und von Axolotl. J. Abelin (*Biochem. Zeit.*, 1921, **116,** 138-64).—It was shown previously that di-iodotyramine had a thyroid-like action on tadpoles. The present communication describes experiments with a number of compounds, organic and inorganic, containing iodine, but only 2, di-iodotyrosine and a degradation product (Jodalbacid) of iodised protein, containing 10% iodine, had a similar action. The metamorphosis of the axolotl is also brought about by di-iodotyrosine.—H. K.

3525. Über den experimentellen Hyperthyreoidismus. Naomi Kaminura (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **23,** 101-47).—Experiments on rabbits and dogs. Dried thyroid, extract, thyreoglobulin, and iodothyrin all produce the same effects on metabolism, etc. Among the symptoms noted are slight hyperglycæmia with glycosuria, midriasis, increased heart action, diarrhœa. There was no rise in the adrenaline of the blood, but a small dose of adrenaline in these animals produces a marked glycæmia.—W. D. H.

3526. Über den Einfluss des Thyreoidins auf die Blutviscosität und Serumconcentration beim Gesunden. B. Frowein (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 162-5).—Prolonged treatment with thyreoidin causes in health and in myxœdema a diminution of the serum concentration.—H. W.

3527. Thyroidectomy and Parathyroidectomy with Relation to the Development of Immune Substances. E. E. Ecker and H. Goldblatt (*J. Exp. Med.*, 1921, **34,** 275-94).—After complete thyroparathyroidectomy (but not after thyroidectomy and partial parathyroidectomy) antibody production is reduced.—C. L. E.

3528. Contribution à l'étude de l'action de la glande thyroïde dans les phénomènes d'immunité. Jeanne Clevers (*Compt. rend. soc. belge de biol.*, 1921, 659-61).—Après ablation de la glande thyroïde chez le lapin, la production de précipitine antiovalbumine est plus forte que chez le lapin normal. Cette réaction d'immunité semble s'installer plus tardivement chez les thyroïdectomisée que chez les normaux.—E. Z.

3529. Influencia de la tiroides sobre la formación de anticuerpos. B. A. Houssay and A. Sordelli (*Rev. Asoc. Med. Argent.* [*Soc. Biol.*, **2,** 108], 1921, **34,** 438).—Les lapins ethyroïdés produisent un sérum hémolytique (anti-mouton) plus actif que celui des témoins. Les lapins et chevaux ethyroïdés produisent des sérums agglutinatifs legérement plus actifs que ceux des témoins (Eberth). Les choses sont plus compliquées quant à la production des antitoxines, car les chiens ethyroïdés produisent des inmunsérums (antidiphterique et antitétanique) un peu plus actifs que ceux des chiens normaux, tandis que les lapins et surtout les chevaux ethyroïdés produisent des sérums de pouvoir très faible comparés à ceux des témoins.—B. A. H.

3530. Sensibilidad comparada de los animales tiroprivos a la intoxicaciòn y a la infección. B. A. Houssay and A. Sordelli (*Rev. Asoc. Med. Argent.* [*Soc. Biol.*, **2,** 105], 1921, **34,** 435).—La thyroïdectomie ne modifie pas la sensibilité des lapins envers le bacille ou la toxine diphteriques, ni celle des cobayes envers les toxines diphteriques ou cobraïque. Les lapins qui ont des symptomes trophiques et un mauvais état de nutrition, sont plus sensibles.—B. A. H.

3531. Thyroidectomy and Ligature of the Thyroid Arteries in Depancreatised Dogs. G. A. Friedman and J. Gottesman (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 281-2).—Three depancreatised dogs were observed. In one case, ligature of the thyroid arteries stopped the glycosuria and lowered the blood-sugar; in a second, this operation had no effect; in the third, thyroidectomy stopped the glycosuria.—D. H. de S.

3532. Le modificazione anatomiche della milza consecutive a tiroidectomia. G. Baggio (*Arch. di Fisiol.*, 1921, **19,** 89-100).—In rabbits care was taken to remove the thyroid without injuring the external parathyroids. The spleen of these animals showed a considerable diminution in size and weight, but no histological changes. This atrophy is probably connected with a cachectic condition affecting the whole organism.—C. d. F.

3533. Physiologie der Drüsen. XLV. Die Reaktion von schilddrüsenlosen und thymuslosen Kaninchen auf den Wärmestich. L. Asher and W. Nyffenegger (*Biochem. Zeit.*, 1921, **121,** 41-63).—The removal of the thyroid or the thymus, or both, from rabbits, whose normal response to heat puncture is a rise of temperature, causes a depression of the degree of rise of temperature. If the normal response is a depression of temperature, then removal of these glands causes an enhanced depression on heat puncture. —H. K.

3534. Exstirpationversuchen der Thymus bei Hunden. Y. Tongu (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **22,** 355-72).—The thymus does not appear essential to life, growth, or health. Its removal produces no rachitic or similar changes which have been described by others in non-Japanese dogs.—W. D. H.

3535. Über Beeinflussung der Harnsäureausscheidung durch Röntgenbestrahlung der Thymüsdrüse. J. Rother and E. Szegö (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 262-9).—The excretion of uric acid after irradiation of the thymus is an indication of the amount of the decomposition of the cell nuclei.—H. W.

3536. La fonction des surrénales. III. Variations de l'action vaso-motrice du nerf splanchnique. E. Gley and A. Quinquand (*J. de physiol. et de pathol. gén.*, 1921, **19,** 355-64).—In 25% of normal dogs the rise of blood-pressure obtained by stimulating the peripheral end of the splanchnic does not show the stepped rise attributed to adrenaline production. In 75% it is present. But in neither case is the nature of the curve altered by removal of the suprarenals. The same applies to the cat, except that the simple rise is more common. In the rabbit the double rise is never seen. —W. M. B.

3537. Dissociation expérimentale des effets vaso-constricteurs et adrénalino-secréteurs de l'excitation splanchnique. A. Tournade and M. Chabrol (*Compt. rend. soc. biol.*, 1921, **85,** 651-4).—An ingenious demonstration of the cause of the "step" in the blood-pressure rise which follows splanchnic excitation. The peripheral end of the right splanchnic of one dog is prepared. The right suprarenal vein of the same dog is then anastomosed with the jugular vein of another dog. Blood-pressure records are taken from the carotid arteries of both dogs. When the right splanchnic nerve of the first dog is stimulated, there is an immediate rise of blood-pressure in the same dog, and a rise in the blood-pressure of the second dog 11 seconds later.—J. H. B.

3538. Adrenaline Hyperglycæmia. A. L. Tatum (*J. Pharm. Expt. Ther.*, 1921, **17,** 395-414).—Subcutaneous injections of adrenaline cause both hyperglycæmia and a

fall in alkaline reserve. Experiments were made to determine whether acidosis within the liver following hepatic vaso-constriction was the immediate cause of the hyperglycæmia. The evidence obtained was against this supposition. It was shown, for instance, that the acidosis produced by the ingestion of acid was not accompanied by such a strong hyperglycæmia as was seen after adrenaline injections. Again, when the alkaline reserve was greatly lowered by phloridzin or gastric administration of strong acids, adrenaline still exerted its usual glycogenolytic activity without producing further change in alkaline reserve capacity.—E. M.

3539. Accion del extracto de hipofisis sobre la poliuria cerebral. B. A. Houssay and E. Hug (*Rev. Asoc. Med. Argent.* [*Soc. Biol.*, **2,** 113], 1921, **34,** 443).—Il faut distinguer l'action immédiate et en 24 heures sur la diurése quand on étudié l'action de l'extrait d'hypophyse. Chez le chien normal ou en polyurie il augmente toujours la diurése immédiate (3 heures). La polyurie a été obtenue par ablation de l'hypophyse où par piqûre de la région peri-infundibulaire.—B. A. H.

3540. Action des extraits d'hypophyse sur la polyurie cérébrale. B. A. Houssay and E. Hug (*Compt. rend. soc. biol.*, 1921, **85,** 681-3).—Extract of posterior lobe of pituitary produces oliguria in guinea-pigs and rabbits when injected subcutaneously, but a polyuria in cats and dogs. This is true for the first few hours after injection. Sometimes dogs show a diminished 24-hour volume of urine following such injections. The authors say this is due to a lessened consumption of water. In dogs suffering from a polyuria due to the hypophysis being extirpated 5 days previously, injections of pituitary extract increased the polyuria.—J. H. B.

3541. Über die Wirkung des Hypophysenextrakte auf die Blutverteilung. Rosenow (*Verhandl. d. deutsch. Kongr. f. inn. Med.*, 1921, 152-4).—Injection of hypophysis leads to an increase of arm volume with diminution of venous pressure. This substance (and also adrenaline) can be used to test the functional condition of the splanchnic vessels. A case of dyspraxia intestinalis angiosclerotica showed almost no arm-volume reaction. Adrenaline does not produce brachycardia, as does hypophysin, but the latter has the advantage of producing no change of respiration in the doses employed. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

3542. Zur Wertbestimmung der Hypophysenpräparate und anderer Wehenmittel. M. Kochmann (*Zeit. physiol. Chem.*, 1921, **115,** 305-10).—The spontaneous contractions of a horn of the guinea-pig's uterus, suitably suspended in a bath of Ringer's solution, are arrested by reducing the Ca content of, and adding $MgCl_2$ to, the solution. When the uterus is quiescent the contractions caused by varying doses of histamine are matched against those due to the pituitary extracts to be estimated. It is claimed that by this method the uteri of large and even of pregnant guinea-pigs may be utilised.—H. W. D.

3543. A Contribution to the Study of the Function of Glandula Pinealis. S. Zandrén (*Acta med. scand.*, 1921, **54,** 323-35).—A description of a boy who grew normally until the age of puberty, at which time his development ceased. An autopsy at the age of $16\frac{1}{2}$ years revealed an aplasia of the pineal, hypoplasia of the testis, but no further endocrine abnormality. It is concluded that the pineal produces an internal secretion which assists the onset of puberty. The symptom complex of macrogenitosomia præcox is not associated with a destruction, but with a hypertrophy of the pineal. The pineal stands in intimate association with the gonads, but has nothing to do with the symptoms of adiposis, cachexia, and idiocy.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3544. Recherches expérimentals à propos d'une fonction glycolytique des amygdales. G. B. Farmachidis (*Gréce méd.*, 1921, **23,** 1-4).—In rabbits and dogs mechanical stimulation of the tonsils produces glycosuria, but in diabetic conditions injection of extracts of tonsils leads to an increase of sugar retention. It is concluded that the

tonsils are endocrine organs concerned with carbohydrate metabolism.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3545. Contributo allo studio della linfogenesi. Sull' azione linfagoga dei preparati surrenali e degli estratti linfatici. A. Chistoni (*Arch. di Fisiol.*, 1921, **19,** 101-21).—The intravenous injection of moderate doses of lymph-gland extracts have in dogs a noticeable lymphagogue action. In the lymph flowing under such conditions from the thoracic duct, the density, dry residue, ash, molecular concentration, viscosity, and electric conductivity are increased. But if doses are rather large, the flow of lymph rapidly diminishes, while blood and hæmoglobin pass into it. Preparations from suprarenal glands have also a lymphagogue action, but the lymph thus obtained is more fluid than normal, and shows a consequent diminution of its density, dry residue, ash, etc.—C. d. F.

REPRODUCTIVE SYSTEM

3546. Études expérimentales sur les glandes sexuelles chez les mammifères. K. Sand (*J. de physiol. et de pathol. gén.*, 1921, **19,** 305-22).—An abstract of the author's book published in Danish in 1918. Some of the conclusions arrived at are: Special importance is to be attached to the interstitial cells of Leydig in the testis, the theca-luteal tissue and corpus luteum in the ovary. Transplantation of testis, when successful, causes complete development of sexual characters in the male and hypertrophy of the clitoris in the female. Transplantation of the ovary into the male causes hypertrophy of the mammary glands. The ovary is able to grow in the interior of the testis, thus producing bisexual characters.—W. M. B.

3547. Über einen Fall experimenteller Verschiebung des Geschlechtsverhältnisses bei Säugetieren. A. Bluhm (*Sitz. d. preuss. Akad. d. Wiss.*, Berlin, 1921, **35,** 549-56).—The litters of normal white mice contain on an average more females than males. If, however, the male parent has been the subject of acute alcoholic poisoning, the litters contain more males than females. It is suggested that there are male-determining and female-determining sperms, and that these react differently to alcohol. —D. H. de S.

3548. Sur le ralentissement de la masculinisation dans la castration partielle. A. Lipschütz, B. Ottow, and C. Wagner (*Compt. rend. soc. biol.*, 1921, **85,** 630-2).—Experiments are described in which partial castration in 2 rabbits and 22 guinea-pigs was followed by a prolongation of the infantile condition of the sexual organs. Yet it is well known that extremely small amounts of testicular substance are enough to effect the transformation from the immature to the adult stage.—J. H. B.

3549. Reproduction in Birds. IX. Stale Sperm and Fertility. O. Riddle and E. H. Behre. **X. Inadequate Shells.** O. Riddle. **XI. Effect of Calcium Salts.** O. Riddle and M. C. E. Hanke. **XII. Effect of Alkaloids.** O. Riddle and C. V. King (*Amer. J. Physiol.*, 1921, **57,** 228, 250, 264, 275-90).—IX. Dove's spermatozoa retain their fertilising power for about 8 days. Staleness has no effect on sex ratio; they show no weakness or modified viability. X. Soft or thin shells may be found among normal ones from the same bird; these embryos have a high mortality; they tend to appear after a long series of normal eggs have been laid. Sperm is not responsible. The available Ca store runs out. XI. Feeding on soluble Ca salts proved no remedy, and decreased the albumen. XII. Atropine in doses (specified in full) slightly diminished the oviducal secretion so far as albumen is concerned, but had no effect on the shell; cocaine diminished both; pilocarpine slightly increased both; nicotine had no effect. Whether the drugs act on secreting cells, nerves, or general metabolism is left open.—W. D. H.

3550. Zur Genese des Corpus Luteum. T. Hirose (*Mitt. a. d. med. Fak. Univ.*, Tokio, 1919, **23,** 63-92).—A histological study relating to various cells which contribute to the formation of the corpus luteum.—W. D. H.

3551. Keimdrüse und Geschlechtsentwicklung. J. Halban (*Arch. f. Gynaekol.*, 1921, **114,** 289-303).—The author's view is that the sex of the gonads and also the sum total of the sex characteristics are determined at the moment of fertilisation. At puberty the inborn sexual characters develop under the protective influence of the gonads. Observations on hermaphroditism and twin formation are explained in terms of this theory, and the divergent views of other writers, and more particularly of Herbst and Steinach, are discussed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3552. Der Bau und die functionelle Bedeutung des menschlichen Diaphragma urogenitale. T. Peterfi (*Zeit. f. d. ges. Anat. I. Abteilung; Zeit. f. Anat. und Entwicklungsgeschichte*, 1921, **61,** 587-627).—The configuration of the diaphragm differs in the 2 sexes, and depends on sexual differentiation. Complete development occurs at puberty. In adults great variations in its configuration were observed.—H. W.

3553. The Chromosome Theory of Heredity. J. S. Huxley (*Sci. Prog.*, 1921, **16,** 235-50).—A general article in which is shown that recently discovered facts and theories can be blended harmoniously in the hypothesis that the chromosomes are the bearers of the hereditary constitution of organisms under the form of a definite structural complex of self-reproducing genes.—W. D. H.

3554. The Formation of the Aster in Artificial Parthenogenesis. R. Chambers (*J. Gen. Physiol.*, 1921, **4,** 33-9).—Aster formation is not only a gel formation, but a separation of liquid, which occurs at a time when the cytoplasm is still fairly liquid. In the normally fertilised egg, both processes are rapid and occur together.—W. M. B.

MILK

3555. Changes in Sheep Milk during Lactation. S. Weiser (*Landw. Vers.-Sta.*, 1920, **97,** 131-40).—Analyses of morning and evening milk are compared. Specific gravity, dry substance, fat, milk sugar, total N, total protein, etc., were determined each month during lactation. Greater changes take place in sheep milk than in cow milk.—W. D. H. (*Chem. Abstr.*).

3556. Inorganic Constituents of Milk. I. Chlorides in Human Milk. W. R. Sisson and W. Denis (*Amer. J. Dis. Children*, 1921, **21,** 389-400).—The average chloride content of all the specimens of milk examined was 58·2 mg. Cl per 100 c.c. It is higher in the first weeks of lactation, and the average of samples taken after the second week was 52·6 mg. Cl per 100 c.c. Normal mothers show only small variations in chlorine content about a mean figure of 38·1 mg.; larger variations are shown by nervous women (see also Abstract No. 2198, Vol. VI., p. 318).—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3557. Verdauungsversuche am Dünndarm junger Ziegen bei Einverleibung arteigener und artfremder Milch. M. Pfaundler and K. Schübel (*Zeit. f. Kinderheilk.*, 1921, **30,** 55-78).—Examination of the intestinal contents of kids fed on goat's milk and cow's milk respectively showed that in the latter case all the constituents of the milk, except sugar, were worse absorbed, and the urine contained sugar and foreign protein.—H. W.

PHARMACOLOGY

3558. The Rôle and Development of Drug Therapy. L. G. Rowntree (*J. Amer. Med. Assoc.*, 1921, **77,** 1061-5).—Recent progress in drug therapy has been rapid, but much remains to be done before medicine becomes the healing *science*. A National

Institute of Pharmacology and Experimental Therapeutics would prove of inestimable value to American medicine.—C. L. E.

3559. Il fumo di tabacco come disinfettante della bocca. V. Puntoni (*Bull. d. R. accad. med. di Roma*, 1920, **46,** 183-6).—Tobacco smoke has a bactericidal action *in vitro*, but under ordinary conditions of smoking this can hardly affect more than the most sensitive bacteria.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3560. L'azione dell' alcool sul ricambio respiratorio nel riposo e nel lavoro. G. Viale and G. Gianturco (*Arch. di Sc. Biol.*, 1921, **2,** 89-119).—During work small quantities of alcohol may be useful, because of their moderating influence on heart strain and on the respiratory mechanism. They are also used by the organism for the production of work and heat in the place of other materials. This influence is particularly evident on high mountains.—C. d. F.

3561. Studi sull' azione della glicerina—IV. I. Simon (*Arch. di Sc. Biol.*, 1921, **2,** 78-88).—The molecular concentration of rabbits' organs is increased after intravenous injections of glycerol. In doses immediately lethal the maximum increase is noticed in the heart, and in order of diminution in muscles, liver, kidney, and brain. If the doses are not immediately lethal, the molecular concentration of the various organs diminishes in proportion to the time intervening between the injections and death. That of the brain, however, continues to increase in the same proportions. —C. d. F.

3562. Ruhestrom und Durchlässigkeit. II. Untersuchungen mit Alkaloidsalzen und einigen anderen organischen Elektrolyten. J. Vorschütz (*Pflüger's Arch.*, 1921, **190,** 54-65).—Experiments with alkaloids in the form of their salts gave no definite indications in favour of Beutner's theory, because those that were not definite muscle poisons produced little effect on the electrical state of the tissue. The effect of alkaloidal salts on muscle is due to the free base formed by hydrolysis. Other organic substances, such as the salts of quaternary ammonium bases, Na salts of salicylic, benzoic, and lower fatty acids, also produce effects which do not harmonise with Beutner's theory. —C. L. E.

3563. Action de la quinidine sur le cœur. F. Arrillaga, J. Guglielmetti, and C. P. Waldorp (*Compt. rend. soc. biol.*, 1921, **85,** 683-4).—Intravenous injections of quinidine into a dog produce a fall of blood-pressure. Quinidine causes the chronaxie of the isolated heart of Leptodactylus to be doubled after 30 minutes' immersion in a solution of 1:1,000. It diminishes the excitability of the isolated frog heart to faradic stimulation. Tachycardia obtained by excitation of the stellate ganglion in the dog is not affected by quinidine.—J. H. B.

3564. The Hæmolytic Action of Certain Quinine Salts. U. N. Brahmachari and P. Sen (*Biochem. J.*, 1921, **15,** 463-5).—Acid quinine salts are more hæmolytic than the corresponding neutral salts, and less so than the free acid in similar concentration. Glucose may retard the hæmolysis. Newly formed corpuscles are more resistant than those normally present in the circulation.—J. A. H.

3565. Über die Bindung des Chinins an die roten Blutkörperchen und über die Verteilung des Chinins im Blute. P. Rona and E. Bloch (*Biochem. Zeit.*, 1921, **121,** 235-58). —By making use of the relation that when the toxic concentration of quinine on the activity of serum lipase is increased in geometrical progression the velocity constants of the hydrolysis of tributyrin by lipase fall off in arithmetical progression, the authors find that 80 to 90% of the quinine added to blood is fixed by the corpuscles. The method is applicable to fractions of a mg. of quinine. After intravenous injection of quinine only, 1 to 4% of the quinine could be found in the blood.—H. K.

3566. Pharmacology of Quinidine. A. E. Cohn and R. L. Levy (*Proc. Soc. Exp. Biol. and Med.*, 1921, **18,** 283-4).—Intravenous injection of quinidine sulphate into

dogs produced a fall of blood-pressure, increase in force of the heart-beat, and some change in the T-wave of the electrocardiogram. The lethal dose was very variable. Death was due in one case to ventricular fibrillation; in the other cases there was progressive slowing of the heart, sometimes with the occurrence of sino-auricular block. The auricles, as a rule, ceased before the ventricles.—D. H. de S.

3567. Acciôn de la quinidina sobre el corazôn. F. Arrillaga, J. Guglielmetti, and C. Waldorp (*Rev. Asoc. Med. Argent.* [*Soc. Biol.*, **2,** 124], 1921, **34,** 454).—La quinidine est hipotensive chez le chien. Elle produit une accélération cardiaque, puis une bradycardie. La chronaxie du cœur augmente fortement (diminution d'excitabillité); la periode refractaire s'allonge, les extrasystoles finissent par ne plus s'obtenir (grenouille); la fibrillation auriculaire (chien) ne peut plus être produite par faradisation, et si elle existe dèjà elle este arretée par une injection veineuse. Le vague dévient inexcitable (chien, grenouille), premièrement le tronc préganglionnaire, puis plus tard les fibres postganglionnaires. Les accélérateurs conservent jusqu'à très tard leur excitabilité. La quinidine annulle l'effet hypertensif de l'adrenaline.—B. A. H.

3568. Zur Kenntnis vom Schicksal des Morphins—III. K. Tamura (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1920, **23,** 219-33; see Abstract No. 1011, Vol. VI., p. 153).—The kidneys are permeable to morphine in both acute and chronic poisoning, provided its concentration in the blood exceeds a certain level. Some of the morphine is found in the fæces, especially in unaccustomed dogs. The fraction which leaves by this channel is $\frac{1}{3}$ to $\frac{1}{4}$ after large doses, but it varies with stages of the poisoning. Accustomed animals still show pulse slowing after small doses, for the vagus centre exhibits no immunisation.—W. D. H.

3569. Drugs in Infection. I. Morphine in Experimental Septicæmia. A. Kraft and N. M. Leitch (*J. Pharm. Expt. Ther.*, 1921 **17,** 377-84).—Morphine sulphate lowered the resistance of rabbits to septicæmia produced by *Streptococcus hæmolyticus.* —E. M.

3570. Ricerche farmacologiche sulla sparteina. Sua azione paralizzante sulla innervazione vagale. A. Chistoni (*Arch. di Sc. Biol.*, 1921, **2,** 31-43).—Spartein sulphate has a paralysing action on the vagus, the electric excitability of which is correspondingly diminished. In animals under its influence " indirect " emetics have a little or no action, but " direct " emetics are not affected.—C. d. F.

3571. Zur pharmakologischen Wertbestimmung der Convallaria majalis. S. G. Zondek (*Arch. exp. Path. Pharm.*, 1921, **90,** 276-87).—The active principle of Convallaria has a digitalis-like action. The average amount of this principle (or principles) in the leaves is about 5 times that in digitalis.—J. H. B.

3572. Effect of Benzyl Benzoate on the Leucocytes of the Rabbit. L. A. Emge and J. P. Jensen (*J. Pharm. Expt. Ther.*, 1921, **17,** 415-29).—Various increases and decreases in the number of leucocytes and mononuclear cells following the continuous administration and large single doses respectively of benzyl benzoate are described. In the presence of latent or quiescent infections in rabbits large doses of benzyl benzoate produce an acute return of the disease. Red blood-cells and hæmoglobin are practically unaffected.—E. M.

3573. The Salicylates. XIII. The Liberation of Free Salicylic Acid from Salicylate in the Circulation. P. J. Hanzlik (*J. Pharm. Expt. Ther.*, 1921, **17,** 385-94).—Salicylic acid is liberated from sodium salicylate when the H-ion concentration corresponds to P_H=6·7, but more definitely when P_H=6·5; the presence of 25% serum or plasma in salicylate " buffer " mixtures prevents the liberation of free salicylic acid at a degree of acidity P_H=5·9. It is improbable that free salicylic acid can be demonstrated in the circulation during life, for even in animals fatally asphyxiated the P_H of blood was only 6·8 or 6·9.—E. M.

3574. Vaso-dilator Action of Sugars, Sodium Chloride, and Urea on the Renal and Peripheral Vessels. S. Kondo (*Kyoto Igaku Zasshi*, 1918, **15,** 17-25; *Jap. Med. Lit.*, 1921, **6,** 1).—Dilatation was more marked in the renal than in the peripheral vessels. The action of a sugar was inversely proportional to its molecular weight, and directly proportional to its osmotic pressure.—W. D. H. (*Chem. Abstr.*).

3575. Toxicity of Some Thioureas and Thiuramdisulphides. P. J. Hanzlik and A. Irvine (*J. Pharm. Expt. Ther.*, 1921, **17,** 349-56).—Diphenylthiourea is an active and toxic substance when given to rabbits, its toxicity being twice that of diorthotoluylthiourea. These substances cause depression, followed by increased excitability of higher centres leading to convulsions. Tetramethylthiuramdisulphide is about 10 times as toxic for rabbits as tetraethylthiuramdisulphide. These latter substances are depressants and act slowly.—E. M.

3576. Quantitative Chemotherapy. V. Intravenous versus Intramuscular Administration of Arsphenamine. C. Voegtlin and H. W. Smith (*J. Pharm. Expt. Ther.*, 1921, **17,** 357-76).—The intramuscular administration of arsphenamine and neoarsphenamine is just as efficacious as the intravenous administration of these drugs in the treatment of experimental trypanosomiasis, as judged by the minimum effective dose and the percentage of survivals of treated animals. The ratio of the minimum lethal dose to the minimum effective dose (amount which will just clear the blood-stream of parasites in 24 hours) is a substantial index to the curative power of a given drug under experimental conditions.—E. M.

3577. Über die pharmakologische Wirkung des kolloidalen Arsensulfids. E. Meneghetti (*Biochem. Zeit.*, 1921, **121,** 1-39).—Colloidal arsenious sulphide, in whatsoever way it is administered, to rabbits dogs, or guinea-pigs, changes its state of dispersion and becomes granular. Intravenously this may cause embolism of the lung capillaries, but if the animal survives, the after-effects are those of a metabolite, probably arsenious oxide.—H. K.

3578. Incitamin (Fischer's Fluid). J. F. Fischer (*Lancet*, 1921, ii., 933-5).—A preparation made of horse serum (treated with trypsin and freed from coagulable protein), horse saliva, and carbolic acid is recommended for local treatment of ulcers, troublesome sores, and the like. No details of composition or preparation are given. Specimen cases out of 50 so treated show favourable results; necrosed tissue sloughs off, partial necrosis ceases, and epidermal growth is stimulated. This treatment in tubercular, syphilitic, and cancerous sores is palliative only.—W. D. H.

TOXICOLOGY

3579. Zur Chloroformnachwirkung im Tierversuch. W. Teschendorf (*Arch. exp. Path. Pharm.*, 1921, **90,** 288-317).—An attempt to determine the amount of chloroform which must be administered to produce after-effects, such as fatty infiltration of liver and kidney.—J. H. B.

3580. The Treatment of Carbon Monoxide Poisoning. H. W. Haggard and Y. Henderson (*J. Amer. Med. Assoc.*, 1921, **77,** 1065-7).—An important factor is the excessive ventilation after removal from the CO atmosphere. By administering 8 to 10% of CO_2 in oxygen, recovery is accelerated.—C. L. E.

3581. Zur Frage des Zusammenwirkens von Ionen und organischen Giften—I. H. Handovsky (*Pflüger's Arch.*, 1921, **190,** 173-6).—Saponin causes hæmolysis of red cells less readily when these are suspended in isotonic sugar than when in isotonic NaCl solutions. In isotonic mixtures of the two substances the reduction of resistance

to hæmolysis is proportional to the NaCl concentration. The causes of this are discussed.—C. L. E.

3582. Über biologische Wirkungen proteinogener Amine. Zugleich ein Beitrag zur Frage der Acetonitrilreaktion. O. Wuth (*Biochem. Zeit.*, 1921, **116,** 237-45).—Reid Hunt showed that the toxicity to mice of acetonitrile is greatly diminished by previous administration of thyroid substance. The author finds that tyramine and di-iodotyramine can likewise protect mice against acetonitrile. Histamine is, however, without action.—H. K.

3583. Bromine Poisoning through Mother's Milk. F. v. d. Bogert (*Amer. J. Dis. Children*, 1921, **21,** 167-9).—A nursling had a bromide eruption; it was then found that the mother was taking bromide, and that her milk contained Br in more than traces. —W. D. H. (*Chem. Abstr.*).

3584. Sur le calcul des doses toxiques. M. Ide (*Compt. rend. soc. belge de biol.*, 1921, 669-70).—Le chloroforme continue de s'absorber durant toute la narcose, quoique le sang et le tissu nerveux semblent rapidement en équilibre de charge. Ce chloroforme tardivement absorbé, se fixe sur les lipoïdes dormants du corps. Ainsi la dose mortelle est apparemment dépassée. Ce fait doit se répéter pour tous les lipo-solubles et même pour les autre poisons, tels que les glucosides.—E. Z.

3585. Adsorción de los venenos de serpientes por el carbon. M. A. C. de Houssay (*Revista del Inst. Bacteriol.*, 1921, **2,** 197-230).—L'adsorption des venins (cobra, Lachesis) ne suit pas la loi de Freundlich. Le sérum antitoxique n'est pas adsorbé par le charbon. Il est probable que l'hémolysine du venin se distribue entre 2 adsorbants (charbon et proteines du venin). On peut separer dans le venin de *Lachesis neuwiedi* une partie qui est adsorbée par le charbon (dissociable à 50° à 70°) et une partie qui n'est pas adsorbée, n'est pas hémolytique et fixe l'antitoxine. Les deux parties separées sont inactives, le mélange des deux a le pouvoir hémolytique initial du venin.—B. A. H.

3586. Über die toxische Wirkung des arteigenen Hämoglobins. S. Matsumura (*Mitt. a. d. med. Fak. k. Univ.*, Tokio, 1919, **22,** 465-510).—Experiments on rabbits and dogs. Hæmoglobin given intravenously is poisonous. Large doses cause respiratory distress, convulsions, and death. Body temperature falls 1° to 2°, then rises 2°; muscular flutter and hæmoglobinuria occur. So also does vaso-constriction, which causes the arterial pressure to rise. It has no action on the frog's heart. Part is excreted into the peritoneal cavity; the part which leaves by the kidney passes out via glomeruli. It increases intestinal peristalsis, slightly dilates the pupil of the isolated frog's eye, but has no action in the isolated uterus of rabbit or guinea-pig.—W. D. H.

3587. Sur l'immunité naturelle du lapin contre l'atropine. H. C. van der Heyde (*Arch. néerl. de physiol.*, 1921, **5,** 380-433).—When atropine is added to blood-serum of various species it becomes physically bound, physiologically inactive, and is chemically destroyed; the tissues or tissue juices of the rabbit, however, destroy atropine much more rapidly than those of the cat. White of hen's egg can also destroy atropine. The substance in serum which destroys atropine is apparently formed by the leucocytes; the process of destruction resembles a ferment action, and is separable into two phases: a physical union, reaching a maximum in about half an hour, with which the physiological inactivation runs parallel, followed by chemical destruction which obeys a monomolecular reaction law. There is no relation between atropine destruction and the thyroids.—C. L. E.

PATHOLOGY

3588. La tension superficielle et la suppression du choc par l'hyposulfite de soude. W. Kopaczewski (*Compt. rend.*, 1921, **173,** 451-3).—The effect is stated to be associated with the fact that the salt prevents a rise of surface tension of serum on dilution.—C. L. E.

3589. Sur les rapports du choc anaphylactique avec l'introduction de précipités dans la circulation. A. Lumière and H. Couturier (*Compt. rend.*, 1921, **173,** 461-3).—It is found that injection of an emulsion of white beeswax into the right heart of the guinea-pig is followed by no sign of shock, though introduction into the left heart produces an anaphylactic crisis. This, however, does not occur if both carotids are previously ligatured. The authors conclude that the precipitate is arrested in the pulmonary or capillary circulation.—Ha. W.

3590. L'oléate de soude dans les phénomènes de choc. A. Lumière and H. Couturier (*Compt. rend.*, 1921, **173,** 530-2).—Sodium oleate is said to protect against anaphylactic shock by diminishing surface tension. The authors have investigated its action on normal animals. If the dose injected into the jugular vein is progressively increased, more and more severe anaphylactic symptoms appear, death always resulting after 2 c.c. of a 2% solution. These results are produced by smaller doses if the arterial system is used. When the solution of sodium oleate is mixed with a shock-provoking injection of antigen or $BaSO_4$ the shock is aggravated. For the protective action of sodium oleate to appear, it must be given in a dose sufficiently small and a certain time before the injection which provokes shock; conversely, inert substances or vaccination of anaphylactised animals protect against sodium oleate. It is suggested that the protection consists in accustoming the endothelium of the cerebral vessels to the irritating effect of precipitates.—Ha. W.

3591. Intestinal and Hepatic Reactions in Anaphylaxis. W. H. Manwaring (*J. Amer. Med. Assoc.*, 1921, **77,** 849-52).—The anaphylactic reaction in guinea-pigs and dogs is characterised by the sudden formation of smooth muscle relaxing substances by the liver; these directly cause hepatic vaso-dilatation in dogs, and are directly or indirectly responsible for the general vaso-dilatation. In guinea-pigs these substances tend to overcome the initial bronchial and vascular spasms, and may even prevent these if the protein injection be made into the mesenteric veins. The nature of these relaxing substances is unknown. In dogs the hepatic reaction appears to be secondary to a preliminary serum reaction, while the hæmorrhagic intestinal lesions are secondary phenomena due to local action of intestinal enzymes.—C. L. E.

3592. Observations on the Relation of Urea to Uræmia. L. Leiter (*Arch. Int. Med.*, 1921, **28,** 331-54).—"The injection of urea intravenously in dogs produces a train of symptoms entirely analogous to that found in convulsive or true uræmia in man."—J. H. B.

3593. Etudes physiologiques sur le cancer. I. Le problème des tumeurs et la chimie inorganique. N. Waterman. **II. La consommation d'oxygène dans quelques tumeurs.** N. Waterman and M. Dirken (*Arch. néerl. de physiol.*, 1921, **5,** 305-27, 328-44).—I. The statement that the rate of growth and of degeneration in malignant tumours is related to the K-Ca balance is confirmed; the ratio, however, has no diagnostic value. There is no relation between the composition of the ash of tumours and that of the serum of the same patient, which latter shows no different relations of K, Na, and Ca from that of normal serum; this difference between the inorganic ions of the tissue and the serum raises interesting questions of permeability. II. Portions of tumour tissue or of normal kidney or muscle were placed under liquid paraffin in a Ringer corpuscle suspension saturated previously with oxygen and kept at 37°; the loss of oxygen of the suspension

was estimated by Barcroft's method at given intervals. The oxygen usage of the tumour tissue is stated to be higher than that of the controls of normal tissue of comparable cellular density.—C. L. E.

3594. Action du sérum antiplaquettique sur l'anaphylaxie sérique. E. Zunz et P. Govaerts (*Compt. rend. soc. belge de biol.*, 1921, 664-6.).—L'injection intrapéritonéale de sérum antiplaquettique, faite vingt-quatre heures avant la réinjection intraveineuse de sérum de cheval à des cobayes préparés tois semaines auparavant au moyen de ce sérum, atténue légèrement le choc anaphylactique. L'atténuation paraît être moindre dans l'anaphylaxie sérique que chez les cobayes auxquels on injecte du sérum traité par l'agar, ce qui tient peutêtre à la complexité des facteurs mis en jeu par l'injection de sérum antiplaquettique.—E. Z.

3595. Action du sérum antiplaquettique sur l'élimination des microbes introduits dans la circulation. P. Govaerts (*Compt. rend .soc. belge de biol.*, 1921, 667-8).—L'injection de sérum antiplaquettique détermine chez le cobaye du purpura hémorragique et une diminution considérable du nombre des plaquettes dans le sang circulant. Chez les animaux ainsi préparés, le bacille typhique introduit dans les veines s'élimine plus rapidement que chez les cobayes témoins.—E. Z.

3596. Zur Chemie der Wassermannreaktion. J. Forssman (*Biochem. Zeit.*, 1921, **121,** 180-214).—The substance responsible for the Wassermann reaction is precipitated in the globulin fraction. The substance can be separated from the globulin by 0·8% NaCl, and other experiments on sera treated with ether point to the active substance being a lipoid.—H. K.

3597. Über Fällungsbedingungen der Wa.R.-Antigene (Herzextract). R. Müller (*Biochem. Zeit.*, 1921, **116,** 215-23).—When an alcoholic extract of ox-heart is added to NaCl solutions of various concentrations, a colloidal solution is primarily obtained; further addition of the alcoholic solution leads to precipitates. The higher the initial concentration of the saline solution, the smaller the quantity of the alcoholic heart extract necessary to produce precipitation.—H. K.

3598. Complement Fixation.—C. The Rate of Fixation of Complement at Different Temperatures. R. L. Kahn (*J. Exp. Med.*, 1921, **34,** 217-30).—Complement fixation studied with protein antigens and specific immune sera show that the rate of fixation depends on the concentration of antibodies in the immune sera, that fixation is almost complete during the first hour, and is practically completed after 4 hours in the ice-chest. Rate of fixation is practically independent of temperature.—C. L. E.

3599. Zur Frage antigener Fettwirkungen. H. Beumer (*Biochem. Zeit.*, 1921, **121,** 127-30).—Stuber's results (*ibid.*, 1916, **77**) could not be confirmed.—H. K.

3600. Ricerche sulla formazione di sostanze antibatteriche nel sangue in vitro. R. Paolucci (*Hæmatologica*, 1920, **1,** 523-39).—The author confirmed Wright's observation that by means of bacterial vaccines antimicrobic properties appear in the blood removed from the influence of tissues. These properties, though probably bactericidal, are non-specific and thermolabile.—C. d. F.

3601. Über die Bedeutung der Reihenfolge in der Biologie—II. L. Karczag and K. Hajós (*Biochem. Zeit.*, 1921, **122,** 52-7).—That the order of mixing of the components is of influence the authors show by a study of the systems: (*a*) The antitryptic action of serum (trypsin + casein + serum); (*b*) the hæmolytic system (corpuscles + complement + hæmolysin); (*c*) the bacteriolytic action of immune serum on paratyphoid B. —H. K.

PLANT PHYSIOLOGY

GENERAL

3602. A propos d'un travail de Meves sur le chondriome de la cellule végétale. A. Guilliermond (*Compt. rend. soc. biol.*, 1921, **84,** 202-5).—The author agrees with Meves (*Arch. f. mikros. Anat.*, 1917) that the plastids of higher plants arise from mitochondria that are identical with the mitochondria of animal cells. He disagrees with Meves as to the significance of leucoplasts. According to Guilliermond, there are two kinds of mitochondria in green plants which are morphologically similar but physiologically different, one variety giving rise to the plastids, the other being inactive in photosynthesis.—W. S.

3603. The Agriculture of Utah. F. S. Harris (*Utah Agric. Coll. Exp. Stat., Circ.* **44,** 1921, 32 pp.).—A review of the present position.—W. S.

3604. Thirty Years of Agricultural Experiments in Utah. F. S. Harris and N. I. Butt (*Utah Agric. Coll. Exp. Stat., Circ.* **46,** 1921, 64 pp.).—A summary of the work performed at the station, with a bibliography of 286 publications containing the results of the work.—W. S.

3605. Correlation and Causation. I. Method of Path Coefficients. S. Wright (*J. Agric. Res.*, 1921, **20,** 557-85).—In biology one "often has to deal with a group of characteristics or conditions which are correlated because of a complex of interacting, uncontrollable, and often obscure causes." The degree of correlation between two variables gives merely the resultant of all connecting paths of influence. "The author presents a method of measuring the direct influence along each separate path in such a system, and thus of finding the degree to which variation of a given effect is determined by each particular case. The method depends on the combination of knowledge and the degrees of correlation among the variables in a system with such knowledge as may be possessed of the causal relations." The method is applied to Briggs and Shantz' transpiration data. For the mathematical method employed, reference must be made to the paper.—V. H. B.

3606. Fourth, Fifth, and Sixth Annual Reports of the Experimental and Research Station, Turner's Hill, Cheshunt, Herts (1918, 1-36; 1919, 1-38; 1920, 1-74).—Gives the results of experiments carried out to test (1) the behaviour of tomato plants and of cucumber plants according to their position in the greenhouse; (2) the relation of early stem-growth to crop in the case of cucumbers; and (3) the effect of soil sterilisation on crop yield. The fifth report gives further details, and the sixth deals specially with sterilisation of soil and plants.—C. W.

3607. The Plants of the Indian Desert. T. S. Sabnis (*J. Indian Bot.*, 1921, **2,** 157-73).—Deals with Chenopodiaceæ, Polygonaceæ, Aristolochiaceæ, Euphorbiaceæ, Liliaceæ, Commelinaceæ, and Cyperaceæ.—C. W.

CHEMICAL

3608. Variation des acides organiques au cours de la pigmentation anthocyanie. D. Kohler (*Compt. rend.*, 1921, **172,** 709-11).—As a contribution to the problem of whether anthocyans arise by oxidation in the cell, the author has investigated whether organic acids (free and combined) also arise simultaneously by oxidation. The facts seem to be otherwise with isolated parts of plants that are undergoing coloration, while with attached parts acids may increase or decrease.—F. F. B.

3609. Contribution à l'étude du rôle physiologique des anthocyanes. S. Jonesco (*Compt. rend.*, 1921, **172,** 1311-3).—In spite of our knowledge of the chemistry and

cytology of anthocyans, their function is still highly problematical. The author's contribution is to show that when the red colour of buckweat seedlings disappears, through growing them in darkness, this is not due merely to conversion to flavone glucosides of pale colour, but that the total amount of flavone and anthocyan glucosides diminishes largely, falling to about $\frac{1}{6}$ of normal after 10 days in darkness.—F. F. B.

3610. Sur la substance organique fondamentale de l'amylopectine. M. Samec and A. Mayer (*Compt. rend.*, 1921, **172,** 1079-82).—Further study of the degradation products of starch grains, their M.W., conductivity, and behaviour on electrodialysis. A new terminology of these products is proposed.—F. F. B.

3611. Sur le lathyrisme ou intoxication provoquée par les graines de gesses. Sur les graines à autofermentation sulfhydrique de la famille des papilionaceæ. M. Mirande (*Compt. rend.*, 1921, **172,** 1142-3, 1202-4).—The seeds of *Lathyrus sativus* caused poisoning of many horses during the war. On investigation, it appears that when the cotyledons are ground up and moistened at 35° C., a quantity of SH_2 is set free. The mother substance of this fermentation may be removed by careful washing, and the residue is not then toxic. If the whole seeds are soaked in water, the initial stages of germination seem to do away with the mother substance completely, and no SH_2 is generated. The second note enumerates the various species in which this production of SH_2 can be detected.—F. F. B.

3612. Acerin. The Globulin of the Maple Seed (Acer saccharinum). A. J. Anderson and W. L. Kulp (*J. Biol. Chem.*, 1921, **48,** 23-32).—The principal protein of the seed of the silver maple is a globulin, for which the name acerin is proposed. Its composition is indicated by C, 51·44; H, 6·80; N, 18·34; S, 0·55; O, 22·87%, and on analysis by the Van Slyke procedure a considerable percentage of the basic nitrogen was present as lysine.—J. C. D.

3613. Über die Cellulose der Flechten und Hefe, sowie über den Begriff "Hemicellulose" und die Hefeautolyse. E. Salkowski (*Zeit. physiol. Chem.*, 1921, **114,** 31-8).—Lichen and yeast celluloses are easily hydrolysed. The "hemicellulose" theory of Schulze is criticised, and the author is of the opinion that it is only possible to decide whether a substance should be described as cellulose or hemicellulose when it can be obtained in fairly pure condition. Yeast cellulose, heated with water under pressure, yields erythrocellulose, which gives a strong colour with iodine, and achroocellulose, which does not give a colour with iodine. So-called yeast glycogen is apparently simply erythrohydrocellulose.—H. W. D.

3614. Die wasserlöslichen Farbstoffe der Schizophyceen. K. Boresch (*Biochem. Zeit.*, 1921, **119,** 167-214).—An extensive investigation by spectro-photometric methods of the water-soluble pigments present in various species of Schizophyceæ. Unless the algal gatherings were exceptionally pure, they were grown in pure culture to amass sufficient material for extraction. The author finds two water-soluble pigments in the order; either may occur alone in particular species, or both may occur together. "Phyco-cyanin" is a blue pigment with more or less carmine red fluorescence, and a maximum absorption between C and D lines. "Phyco-erythrin" of Schizophyceæ is a red pigment with orange-yellow fluorescence, and maximum absorption in the green between D and E lines. The pigment is different from the phyco-erythrin of the Rhodophyceæ, a pigment showing three absorption maxima, none identical with the single maximum of the Cyanophycean pigment.—J. H. P.

3615. Über den Mangangehalt von (holländischen) Samen. D. H. Wester (*Biochem. Zeit.*, 1921, **118,** 158-63).—Manganese estimated in the ash of seeds of various species taken from groups ranging from Pinaceæ to Compositæ. Manganese is invariably present, usually from 2 to 6 mg. Mn per 100 g. dried material, but in some cases the amount is much higher, notably *Lupinus luteus* L. with 67·8 mg.—J. H. P.

3616. Manganese in Foxglove Leaves. Wester (*Ber. deut. pharm. Ges.*, **30,** 376).—Mn is a constant constituent of foxglove leaves. It is also present in *Digitalis ambigua* and *D. lutea*.—W. S. (*Chem. Abstr.*).

3617. Documents concernant l'amidon des algues floridées. Mangenot (*Compt. rend. soc. biol.*, 1921, **84,** 406-9).—The grains in cells of red algæ, which give a mahogany to violet-red colour with iodine, were investigated in the case of *Lemanea*. The grains have no relation to the chloroplasts, and are not, therefore, typical starch grains; they are rather analogous to the glycogen granules of the fungi.—W. S.

3618. Chemistry of Higher Fungi. XIV. Lactarius furus, Scopol., Lactarius pallidus, Pers., and Polyporus hispidus, Fr. J. Zellner (*Monatsh.*, 1920, **41,** 443-53).—Chemical analyses are given.—W. S. (*Chem. Abstr.*).

3619. Biochemistry of the Mahua Flower. G. J. Fowler, J. D. E. Behram, S. N. Bhate, K. H. Hassan, S. Mahdihassan, and N. N. Inuganti (*J. Indian Inst. Sci.*, 1920, **3,** 81-118).—Glucose, fructose, maltose, sucrose, pentoses, and cellulose were identified in the flowers of *Bassia longifolia* and *B. latifolia*, the total sugar being at a maximum when the flowers are ready to fall, at which stage it approximates to 60 to 70%. In the growing stages fructose is present in greater amount than glucose, but the quantities become more nearly equal, though not exactly so, in the later stages. Maltase, catalase, and oxidase were present throughout development. By fermentation of a mash of flowers with the natural yeast occurring in the flower, together with such reagents as H_2SO_4 and ammonium phosphate, yields of alcohol up to 90% of the theoretical were obtained.—W. S. (*Chem. Abstr.*).

3620. Distribution of Lycorine in Amaryllidaceæ—II. K. Gorter (*Bull. Jard. Bot. Buitenzorg*, 1920 [3] **2,** 331-4).—This alkaloid has been isolated in crystalline form from bulbs and roots of *Amaryllis belladonna*, *Clivia miniata*, *Cooperia Drummondii*, *Cyrtanthus pallidus*, and *Sprekelia formosissima*. The yield is 0·1% or less.—W. S. (*Chem. Abstr.*).

3621. Recherches sur les proteiques de la levure. P. Thomas (*Ann. Inst. Pasteur*, 1921, **35,** 43-95).—Among the proteins extracted from macerated yeast juice, a new phospho-protein and a new albumin were discovered. To these the names zymocasein and cerevisine are respectively given. The former is insoluble in water, contains 16·15% N and 1·8% P, is soluble in alkaline carbonates, and is intermediate between ovovitellin and milk casein. The albumin is soluble in water, contains 16·35% N and 0·9% S, and is coagulated by heat at 41° C. Both contain tryptophane and lysin.—W. S.

3622. Sur le poids et les dimensions des graines arctiques. A. E. Porsild (*Rev. gén. de bot.*, 1920, **32,** 97-120).—Seeds of plants grown in Greenland have a lower specific gravity than those of the same or related species grown further south. This contradicts the view of Scheubeler.—W. S.

3623. The Freezing-Point of Potatoes as determined by the Thermo-electric Method. R. C. Wright and R. B. Harvey (U.S. Dept. Agric. Bur. Plant Ind., *Bull.* **895,** 1921, 1-7).—Using a thermo-electric method, the freezing-point of 18 varieties of potatoes grown under the same conditions was determined. It is shown that (1) the freezing-point tends to rise as the season advances, (2) the freezing-point varies with the variety, (3) the freezing-point of varieties of the same family group are often comparable, (4) early and mid-season varieties have a higher freezing-point than late varieties, and (5) under-cooling is terminated at any point by an outside influence, such as tapping or jarring.—C. W.

3624. Cyanogenesis in Sudan Grass. P. Menaol and C. T. Dowell (*J. Agric. Res.*, 1920, **18,** 447-50).—The amount of HCN was determined at various stages of growth of Sudan grass (one of the sorghums), and it was found to decrease with growth. The

method was to precipitate as Prussian blue, and weight as iron oxide, or else to use the colorimetric method of Francis Connell, which was, however, slightly modified.—V. H. B.

3625. Etudes sur la fécules. A. Reychler (*Bull. soc. chim. de Belgique*, 1921, **30,** 223-5).—La rétrogradation de l'empois affecte surtout la matière pariétale des grains de fécule. Cette matière pariétale se trouve dans un rapport très étroit avec l'amidon artificial, c'est-à-dire avec l'amylose de Maquenne. L'auteur trouve dans la théorie optique de Gillis une confirmation de ses propres vues sur les propriétés optiques des grains de fécule.—E. Z.

ENZYME ACTION

3626. Über die Zerlegung der Brenztraubensäure durch verschiedene Pilze. T. Nagayama (*Biochem. Zeit.*, 1921, **116,** 303-6).—6 species of moulds were all able to decompose pyruvic acid with production of acetaldehyde. The production of the latter was increased by addition of disodium or calcium sulphite.—H. K.

3627. Vom Wesen der Buttersäure- und Butylalkoholgärung. Abfangung von Acetaldehyde als Umsetzungsprodukt. Übergang von Brenztraubensäure-aldol in Buttersäure. Enstehung höherer Fettsäuren aus Zucker. C. Neuberg and B. Arinstein (*Biochem. Zeit.*, 1921, **117,** 269-314).—Glucose in a nutrient medium of inorganic materials and in the presence of a fixative (Abfangmittel)—*e.g.*, sodium sulphite for the acetaldehyde—is fermented by *Bacillus butylicus* (Fitz), with production of about 10% of acetaldehyde. By use of a culture of amylobacter, acetaldehyde could also be qualitatively recognised. Acetaldehyde or its condensation product, aldol, are not the intermediate stages in the butyric fermentation, but the aldol of pyruvic acid, α-keto-γ-valerolactone-γ-carboxylic acid, which gives butyric acid on fermentation. Starch syrup fermented by a culture of *B. butylicus* in an inorganic nutrient medium gave small quantities of the higher fatty acids, of which capric acid was identified with certainty.—H. K.

3628. Über die gärunghemmende Wirkung einiger Chlorderivate des Methans, Äthans und Äthylens. H. Plagge (*Biochem. Zeit.*, 1921, **118,** 129-43).—Ethylidene chloride, ethylene dichloride, dichloromethane, chloroform, and tetrachloroethane are toxic to the yeast cell. The determining factor is not the actual concentration of the solution.—H. K.

3629. Versuche über Vorkommen und Wirkung der Saccharo-phosphatase in Pflanzenorganismus. A. Nemec and F. Duchon (*Biochem. Zeit.*, 1921, **119,** 73-80).—Tested effect of powdered plant tissue upon solutions of sodium or calcium salt of Neuberg's saccharose phosphate in presence of toluol. In solutions after incubation estimations were made of free phosphate by precipitation with magnesia and also of reducing action to see if invertase action was indicated. By this means were demonstrated existence of a "saccharo-phosphatase" enzyme in many resting seeds and in the leaves of *Solanum tuberosum*. These enzymes are increasingly active in acid solutions, but their activity is almost completely inhibited in slightly alkaline solution.—J. H. P.

3630. Über die Verwandlung stickstoffhaltiger Substanzen bei den Endphasen der Hefenautolyse. N. N. Iwanoff (*Biochem. Zeit.*, 1921, **120,** 1-24).—Recognises activity of two proteoclastic enzyme groups in yeast autolysis, proteases converting proteins to peptones, and peptases breaking down peptones to amino-acids. The proteases work best in acid solutions, peptases in solutions that have weakly alkaline reaction. If after autolysis has proceeded some time autolysate is made weakly alkaline, an increase in protein nitrogen, estimated by Stutzer's method, can be observed. This increase is accompanied by negligible loss of amino-N, determined by Van Slyke's method, and occurs at expense of soluble decomposition products of proteins precipitable by phosphotungstic acid and by lead acetate. If the autolysate is kept at higher temperature (56° to 60° C.) after rendering alkaline, a reduction of amino-N takes place, but is not

accompanied by formation of synthetic protein. Author explains this effect as due to formation of humin-like substances by amino-linkages with small carbohydrate residues still present in autolysate.—J. H. P.

3631. Über Eiweiszspaltung in Hefen während der Gärung. N. N. Iwanoff (*Biochem. Zeit.*, 1921, **120,** 25-61).—During fermentation the yeast cell experiences loss of protein. In experimental work where protein is determined by precipitation by copper hydrate (Stutzer's method), this loss is often masked, because during fermentation products are formed which are precipitated by this reagent, though not by lead acetate or phosphotungstic acid. These substances appear to be humin-like substances which are not further split up by proteoclastic enzymes, and which represent nitrogen lost to the yeast plant, as the cells cannot apparently utilise them for their nutrition. They appear, therefore, to be identical with the "excrements of fermentation" postulated by Ad. Mayer in 1869. The formation of these humin-like nitrogenous waste products is not causally connected with the fermentation mechanism.—J. H. P.

3632. Über den Einfluss der Gärungsprodukte auf den Zerfall der Eiweissstoffe in den Hefen. N. N. Iwanoff (*Biochem. Zeit.*, 1921, **120,** 62-80).—Protein decomposition is slower in autolysis of fermented yeast than in unfermented; this has been ascribed previously to production of anti-enzyme during fermentation. Author bases on experimental grounds the conclusion that the hindrance to proteoclastic enzymes produced by fermentation is due solely to two factors: (1) Production of alcohol, which always retards protein digestion; (2) development of acid reaction in solution.—J. H. P.

3633. Wirkung von Säuren auf die Hefegärung. R. Somogyi (*Biochem. Zeit.*, 1921, **120,** 100-2).—The retarding influence of acid is not merely a function of H-ion concentration.—J. H. P.

3634. Zur Kenntnis der Lipase von Aspergillus niger (van Tiegh). R. Schenker (*Biochem. Zeit.*, 1921, **120,** 164-96).—Worked entirely with pure cultures of a strain identical with strain β of Brenner (1914); showed that fungus grew freely in media containing various fats as only source of carbon. Lipase present can be extracted by water or glycerine, expressed in sap or obtained from air-dried mycelium after treatment with acetone. The enzyme can be precipitated by alcohol from expressed sap. The mycelium contains most enzyme when grown upon fatty media, notably as compared with mycelia from substrates containing cane sugar or glycerine. The lipase is active within a limited hydrion concentration, with optimum apparently slightly on acid side of true neutrality.—J. H. P.

3635. Über die Umsetzung der d-Galaktose nach der zweiten Vergärungsforme. M. Tomita (*Biochem. Zeit.*, 1921, **121,** 164-6).—*d*-Galactose, like the three other fermentable hexoses, will give acetaldehyde and glycerine in molecular proportions if fermented in presence of sodium sulphite under suitable conditions.—J. H. P.

3636. Neue Klassen von Stimulatoren der alkoholischen Zuckerspaltung. VII. Mitteilung über chemisch definierte Katalysatoren der Garung. C. Neuberg, E. Reinfurth, and M. Sandberg (*Biochem. Zeit.*, 1921, **121,** 215-34).—Experimental data are given showing that many compounds of the purine group, their derivatives, and compounds containing purine nuclei, markedly accelerate the fermentation of sugar by expressed yeast juice. Their action in this respect in many, if not in all, cases can be brought into line with the authors' previously stated theory that substances capable of acting as hydrogen acceptors have an accelerating action upon the process of fermentation. This effect is more readily demonstrated in experiments with expressed yeast juice than with the living cell; in the latter case other factors are involved, and the same substance may retard fermentation process.—J. H. P.

3637. Sur l'hydrolyse du méthyl-d-mannoside a par les ferments soluble. H. Herissey (*Compt. rend.*, 1921, **172,** 766-8).—An enzyme which readily hydrolyses the above

glucoside has at length been discovered in the germinating seeds of lucerne. This is presumably to be associated with the occurrence in these seeds of a horny endosperm, consisting partly of mannans, and hydrolysing to *d*-mannose under the influence of seminase.—F. F. B.

3638. Application de la loi d'hydrolyse à la détermination des poids moléculaires. H. Colin and A. Chaudun (*Compt. rend.*, 1921, **172,** 278-80).—When sucrase acts upon either sucrose, raffinose, or gentianose in excess, the rate of hydrolysis proceeds at first at a constant rate, and afterwards falls off in accordance with Wilhelmy's law. It is shown for these three cases that the concentrations of sugar at which the transitions take place are directly proportional to the M.W. One has then in this law of hydrolysis a means of determining relative molecular weight of such bodies.—F. F. B.

3639. Application de la méthode biochimique de recherche du glucose à l'étude des produits de l'hydrolyse fermentaire de l'inuline. E. Bourquelot and M. Bridel (*Compt. rend.*, 1921, **172,** 946-9).—We regret to learn that M. Em. Bourquelot, who has done so much to elucidate the biochemistry of enzyme synthesis, died while the present contribution was in progress. It is here established that when inulin is hydrolysed by enzyme fructose alone is formed, though some workers who hydrolysed with acids have asserted that some glucose is also produced. The "biochemical method" adopted is to show that the sugars resulting from hydrolysis do not yield any trace of β-methyl glucoside when treated synthetically in 70% methyl alcohol with emulsin.—F. F. B.

3640. Influence de la chaleur sur l'activité de la salicinase. G. Bertrand and A. Compton (*Compt. rend.*, 1921, **172,** 548-51).—The authors have studied the so-called optimum temperature for the activity of this enzyme. They show that for a set of experiments lasting 1 hour a temperature of 55° C. appears to be optimal, while for a set lasting each 40 hours the optimum appears at 30° C. They present a curve of the falling optimum for intermediate times, and conclude that the expression has no meaning apart from time qualification. Below 30° C. there is no destruction of enzyme, and the optimum keeps at this temperature, anyhow up to 96 hours. The fatal temperature was also studied, and its time relations are set out up to 96 hours. It is concluded that 70° C. stops the activity of this enzyme instantaneously, and that the temperature of the maximum activity for a short enough period practically coincides with this fatal temperature.—F. F. B.

3641. Dosage du maltose ou du lactose en présence d'autres sucres réducteurs (emploi de la liqueur de Barfoed). Legrand (*Compt. rend.*, 1921, **172,** 602-4).—Simultaneous estimations of the reduction with Fehling's solution and Barfoed's solution give a measure of the lactose and maltose which do not reduce the latter. The proportions of maltose and hexose in germinating barley and potatoes have been determined. —F. F. B.

3642. Application de la loi d'action des masses aux résultats obtenus dans la réaction de la galactosidase β sur le galactose en solution dans l'alcool propylique. M. Bridel (*Compt. rend.*, 1921, **172,** 1288-91).—The law of mass action has been shown by Bailly to apply well to enzymic synthesis and hydrolysis of β-methyl glucoside. When the same expressions are applied to the case of β-propyl galactoside, it is found that calculated values do not conform to observed ones. The departure is such as to support the view that while equilibrium may be obtained in a few months with galactose and dilute propyl alcohol, yet with the alcohol above 35% concentration the enzyme is so much enfeebled that equilibrium has not been reached in any of the solutions yet examined.—F. F. B.

3643. A propos des remarques de M. Abelous sur la nature des ferments oxydants et des ferments reducteurs. F. Batelli and L. Stern (*Compt. rend. soc. biol.*, 1921, **84,** 102-3).—Controverts a claim to priority.—W. S.

3644. Sur quelques levures du sura du cocotier (Cocos nucifera). F. de Mello (*Compt. rend. soc. biol.*, 1921, **84,** 584-6).—17 spp. of yeast were isolated from the sap of the floral sheath of *Cocos nucifera*. All the yeasts fermented glucose and fructose, but not galactose, lactose, and sucrose. None were harmful to dogs, guinea-pigs, and monkeys. —W. S.

3645. Contributo alla determinazione degli zucheri mediante la fermentazione alcoolica. A. Constantino (*Arch. di Sc. Biol.*, 1921, **2,** 120-33).—Experiments were made with yeast dissolved in water to which a small quantity of toluol was added. This has the advantage of preventing a further development of Saccharomyces, and allows one to discriminate between autofermentation and alcoholic fermentation. The author used a method previously published for the estimation of small quantities of CO_2 (*Rend. Acc. Lincei*, 1919, **28,** 118). He found that the estimation of sugar by the alcoholic fermentation method is more exact than any other, and that the time required for estimating glucose is only about 70 minutes.—C. d. F.

3646. Vitamin B (Biokatalysatoren) und Co-Enzyme—I. H. v. Euler and A. Pettersson (*Zeit. physiol. Chem.*, 1921, **114,** 4-16).—Experiments on the acceleration of growth and fermentation by the addition of vitamin preparations to various yeasts. —H. W. D.

3647. Über die Thermostabilität des Co-Enzyms und seine Abscheidung von Hefevitamin B. T. Tholin (*Zeit. physiol. Chem.*, 1921, **115,** 235-56).—The thermostability of Harden and Young's co-enzyme is studied. At 100° C. and $P_H = 5{\cdot}6$ its activity is reduced to one-half in 37 minutes. The fermentation accelerating vitamin of cabbage is quite stable at the same temperature and acidity for 6 hours, whilst that of yeast will endure a temperature of 127° C. for 1 hour without any loss of activity. Advantage may be taken of these properties to separate the co-enzyme and vitamin.—H. W. D.

3648. The Activity of Phytase as determined by the Specific Conductivity of Phytin-Phytase Solutions. F. A. Collatz and C. H. Bailey (*J. Ind. and Eng. Chem.*, 1921, **13,** 317-8).—Under the influence of phytase, phytin is split up with the liberation of inorganic phosphate. The course of the enzyme action can therefore be followed conveniently by means of conductivity measurements. The results of such measurements at various temperatures are recorded.—T. R. P.

3649. Contributo alla conoscenza degli enizmi. IV. Emulsina, citasi, ereptasi ed ureasi nell' orzo germagliato. D. Maestrini (*Atti R. Accad. Lincei, Rendiconti*, 1920, [5] **29** [ii.], 164-6).—Emulsin is present in germinated barley. The optimum temperature for the action of the enzyme is 37° to 40° C.; between 50° and 53° C. the enzyme is destroyed. Attack of cellulose by cytase is not recognisable, nor are ereptase and urease. For V. see Abstract 1186, this volume, p. 175.—W. S.

3650. Un nuovo metodo di colorazione della cellulosa e la sua importanza nella ricerca delle citasi. D. Maestrini (*Arch. di Fisiol.*, 1921, **19,** 84-8).—Sections of vegetable buds made by hand by means of a sharp razor are kept for 12 to 24 hours in 20% formic acid, and then transferred into a 1% solution of AuCl. The impregnation is complete after 30 to 40 minutes at 37° C., after a longer time at room temperature. To avoid precipitations, the sections are examined from time to time under the microscope. The preparations can be mounted either in balsam or glycerol, and keep well even for years.—C. d. F.

3651. Invertase Activity of Mold Spores as affected by Concentration and Amount of Inoculum. N. Kopeloff and S. Byall (*J. Agric. Res.*, 1920, **18,** 537-42).—Spores of *Aspergillus niger*, blue aspergillus, and *Penicillium expansum*, are able to invert at 48° to 50° C. cane sugar of any concentration up to saturation. The change was estimated after 3 days by the polarimeter, and the maximum effect was found with concentration of 50 to 60%; the effect also went up with increase in the concentration

of spores. Under the conditions of the experiment the minimum number of spores of blue aspergillus required to bring about perceptible inversion of a saturated solution was 5,000 per c.c. The spores are capable of acting without germination.—V. H. B.

3652. Contribution à l'étude des méthodes de détermination du rendement des matières premières dans les industries des fermentations. C. Chabot et H. Van Laer (*Bull. soc. chim. Belgique*, 1921, 253-7).—L'extrait maximum que peut fournir un malt donné est de loin supérieur à celui que l'on obtient par la méthode conventionnelle. Pour le déterminer, il faut opérer avec une mouture fine, peptoniser pendant 4 h. à 45° et neutraliser environ la 1/2 aux 3/4 de l'alcalinité au méthylorange. Cette dose optima varie naturellement suivant l'alcalinité primitive du malt.—E. Z.

PERMEABILITY

3653. Zur Kenntnis der Neutralsalzwirkungen auf das Pflanzenplansma. H. Kahho (*Biochem. Zeit.*, 1921, **120,** 125-42).—Investigated effect of neutral salts in coagulating protoplasm with a view to seeing if comparative effectiveness, different anions, and kations permitted construction of a "lyotropic" series similar to those obtained by Hofmeister and others in investigating precipitation of proteins by neutral salts. Worked with anthocyan-containing cells of red cabbage and *Tradescantia zebrina*, estimating proportion capable of plasmolysis in strong cane sugar solution, as against proportion coagulated after previous immersion in salt solution for definite period of time. Thus established a series for anions, and that K, Na, and NH_4 more effective than alkaline earth kations. His results rather inverse of "lyotropic" series. Finds explanation in view that coagulation depends upon power of penetration and relative effectiveness of different ions in accordance with data as to their penetrability. Confirms earlier observations that tissues in light more easily penetrable than when kept in dark.—J. H. P.

3654. Effect of Lime upon the Sodium Chloride Tolerance of Wheat Seedlings. J. A. Le Clerc and J. F. Breazeale (*J. Agric. Res.*, 1920, **18,** 347-56).—Very small amounts of CaO and $CaSO_4$, and to a lesser degree $MgSO_4$ and $BaCl_2$, have an antagonistic effect on the toxicity of NaCl and Na_2SO_4. The effect is not due to a reduction in permeability, for CaO appeared to increase the absorption of Na_2SO_4.—V. H. B.

3655. Hydrogen-Ion Concentration Relations in a Three-Salt Solution. H. F. A. Meier and C. E. Halstead (*Soil Science*, 1921, **9,** 325-51).—Wheat plants were grown 5 weeks in duplicate series, during three different time periods, in water-culture solutions composed of the three main salts varied in increments of $\frac{1}{8}$, all having an osmotic value of 1 atmosphere. The salts used were: KH_2PO_4, $MgSO_4$, and $Ca(NO_3)_2$, together with a trace of $FePO_4$. Data are presented which show that the hydrogen-ion concentration of solutions in which wheat has been grown tends to become less than the initial reaction of the solution. It is suggested that the differences in the P_H value of the solutions may be due to selective absorption by the plant of certain ions from the solution. No apparent direct correlation between the yield of the plants and the P_H, or the change of P_H, was found.—C. W.

GERMINATION

3656. L'influenza delle basse temperature sulla germinazione del frumento appena raccolto e dei semi cosi detti freschi. O. Munerati (*Atti R. Accad. Lincei, Rendiconti*, 1920, [5] **29,** [ii.] 273-5).—Grains of *Avena sativa* and *A. fatua* can be brought to germinate immediately after ripening and harvest by exposure to a temperature of 12° to 15° C., when after 3 days 81% of the grains germinate. This compares with 14% at 25° to 27° C., and 3% at 32° to 35° C.—W. S.

3657. Action nocive des feuilles mortes sur la germination. A. Lumière (*Compt. rend.*, 1921, **172,** 232-4).—It is shown that extracts of dead leaves in the early stages of decay contain reducing substances which retard or inhibit the germination of seeds soaked in them. It is suggested that only when time has been allowed for complete oxidation is vegetable débris innocuous to germination, and that this factor contributes to the seasonal rhythm of vegetation in the open.—F. F. B.

3658. Germination of Barley Pollen. S. Anthony and H. V. Harlan (*J. Agric. Res.*, 1920, **18,** 525-36).—The grains are very sensitive to moisture; if there is too little the cells collapse, and if there is too much or the humidity raised too abruptly the cells burst. Also a proper range of humidity must coincide with a certain range of temperature for successful germination. Under field conditions 60% of the artificial pollinations were successful.—V. H. B.

VEGETATIVE DEVELOPMENT

3659. A propos des greffes de soleil sur topinambour. L. Daniel (*Compt. rend.*, 1921, **172,** 610-2).—The author opposes the view that when *Helianthus annuus* is grafted upon *H. tuberosus*, the inulin in the tubers of the latter is derived from the dextro-rotatory sugars of the graft. The effect of cutting the stock without actually grafting on it is studied, and also various defoliations, all in terms of yield of tubers. The general conclusion is that such tubers as form after grafting are due to the assimilatory activity of the stock itself.—F. F. B.

3660. Teratologia sperimentale. G. Lo Priore (*Riv. di biol.*, 1921, **3,** 1-32).—The different origins of malformations are considered. Many are to be traced to variation tendencies, which are allowed to come into play through different external conditions. External factors, the influence of symbiosis, and of fungal and insect parasites, and internal factors can all play a part.—W. S.

3661. Notes on Loranths from Wagga District. G. M. Le Plastrier (*Australian Nat.*, 1920, **4,** 139).—These parasites have leaves resembling those of the hosts on which they grow.—W. S.

GROWTH OF LOWER PLANTS

3662. Les végétaux inférieurs et les facteurs accessoires de la croissance. P. Goy (*Compt. rend.*, 1921, **172,** 242-4).—Yeast, moulds, and bacteria can flourish well on media prepared from the purest chemicals, so that they show no sign of needing anything of the nature of vitamins for their development. Nevertheless, it is found that traces of certain extracts greatly accelerate the rate of growth, though the final yield is not increased. The extract that is so active is an ordinary mineral medium in which the same or a different organism has been growing. This contains an organic substance, which can be extracted directly from a mucor culture by ether. This substance has not been identified, but has been crystallised and studied. It only accelerates growth after its solution has been once heated to 85° C. It seems not to be an amino-acid, nor to have any of the chemical characters of vitamins. Tissues of higher plants also yield a similar activator after heating, while the juice of orange or lemon works without the heating.—F. F. B.

3663. Observations sur une algue cultivée à l'obscurité depuis huit ans. A. P. Dangeard (*Compt. rend.*, 1921, **172,** 254-60).—*Scenedesmus acutus* has been cultivated pure in nutritive media in complete darkness for 8 years, being inoculated on to a new medium every 2 to 3 months. The original green colour has been kept up perfectly, and the chlorophyll is normal on spectroscopic study. The organic matter is glucose 1%, and peptone 0·08%. With stronger glucose colourless cells may be developed. The cells divide every 24 hours. The chlorophyll function is not impaired

by disuse, and the cells produce oxygen from CO_2 when illuminated. The cytological changes which the cells undergo in dark culture are described in detail and figured. The pyrenoid disappears, but on bringing cultures into the light a new one appears after a few days. Enormous starch grains may occur in a few individuals grown in this sugar medium in the dark.—F. F. B.

3664. Influence des radiations lumineuses sur l'azotobacter. E. Kayser (*Compt. rend.*, 1921, **172,** 183-5, 491-3, 939-40).—A continuation of previous work on the influence of green, yellow, and blue screens on the nitrogen fixation of Azotobacter in a medium of glucose and mannite. The different cultures have been followed for six generations, and careful analyses of the nitrogen fixed and the sugars destroyed are given. The fixation of nitrogen per unit of sugar used is lowest in yellow light, but in other lights is higher than in darkness. The yellow, however, is on the increase from generation to generation, while in the other lights this ratio is falling. In a second note data up to the twelfth generation are provided, and some experiments on change from one light to another are described. In the third note it is shown that nitrogen goes slower at low temperatures, but is more efficient in relation to the quantity of mannite consumed.—F. F. B.

3665. Influence du chlorure de sodium sur le développement du Sterigmatocystis nigra. M. Molliard (*Compt. rend.*, 1921, **172,** 1117-9).—The growth of the mycelium in cultures was followed for media containing 4 or 8 or 10% NaCl in addition to cane sugar, ammonium nitrate, and the usual salts. Figures are given for the dry weight of mycelium formed and the sugar consumed in the different cultures up to 30 days. In water the yield of mycelium may be half the weight of sugar used; but with increasing NaCl, while the growth rate is much slackened, the efficiency is diminished, and only $\frac{1}{5}$ of the sugar consumed may reappear as mycelium. In water, after the third day the mycelium diminishes very much in weight by autolysis. In 8% NaCl the mycelium may keep at an equilibrium weight from day 15 to day 30, but respiring large quantities of sugar all the time.—F. F. B.

3666. Influence des vitamines et des auximones sur la croissance des végétaux. A. Lumière (*Ann. Inst. Pasteur*, 1921, **35,** 102-23).—The increased growth of yeast and *Penicillium* brought about by the addition of extracts of organic material to substrata poor in nutrients is not due to the vitamins present in the extracts, but to accompanying substances, for the same result can be obtained by the addition of mineral salts.—W. S.

3667. La concentration optima en ions d'hydrogène favorisant le développement de certains micro-organismes. K. G. Dernby (*Ann. Inst. Pasteur*, 1921, **35,** 277-90).—Discussion of measurement of H-ion concentration in relation to growth of pathogenic bacteria.—W. S.

3668. On the Dependence of the Growth of Bacteria on the Reaction of the Substratum. A. H. Johansen (*Hospitals-tidende*, 1920, **63,** 777-85 [Danish]).—The relation between rate of growth and P_H of the medium was investigated in the case of a number of pathogenic bacteria.—W. S. (*Ber. ü. d. ges. Physiol.*).

3669. Über die Einwirkung von Salzen auf die Entfärbung des Methylenblaus durch verschiedene Hefesorten. H. Kumagawa (*Biochem. Zeit.*, 1921, **121,** 150-63).—Different races of yeasts have very varying powers of reducing methylene blue. Reducing activity of preparations of dried yeast of same variety, made under different conditions, also varies enormously. Many metallic salts inhibit or retard this reducing action, but there is no evidence that these salts produce their effect by their direct action upon an enzyme complex.—J. H. P.

3670. Nodule Bacteria of Leguminous Plants. F. Lohms and R. Hansen (*J. Agric. Res.*, 1921, **20,** 543-50).—The nodule bacteria of these plants are to be divided into

two groups, differing physiologically and morphologically. *Bacillus radiobacter* is regularly present in the nodules, and it stimulates the development and activity of the nodule bacteria.—V. H. B.

3671. The Effect of Organic Nitrogenous Compounds on the Nitrate-Forming Organism. E. B. Fred and A. Davenport (*Soil Science*, 1921, **9**, 389-407).—*Nitrobacter* was grown on washed nitrite agar, and on slants of Nährstoff-Heyden agar with and without nitrite present, and retained its power of oxidising nitrites to nitrates. No evidence was found to support Beijerinck's statement that the nitrate-forming organism, when grown in the presence of certain organic substances, loses its power of oxidation; on the contrary, it was found that certain forms of organic matter benefited rather than injured these organisms.—C. W.

3672. The P_H Range for Staphylococci. I. W. Hall and A. D. Fraser (*Brit. J. Exp. Path.*, 1921, **2**, 242-6).—The general P_H range for the staphylococcal group extends from 2·6 to 10. But variations occur. These variations do not exhibit any relation to saprophytic or pathogenic characters. They do not admit of much experimental adaptation. The capacity for alkali production in sugar-free media is more evident in lower than higher P_H concentrations. By substitution of various acids in the acid series a limiting of the P_H range has been produced on the one hand and a definite acceleration of growth on the other, nitric acid being an outstanding adjuvant.—*Authors' Abstract.*

ASSIMILATION

3673. Sur le mécanisme chimique de l'assimilation du gaz carbonique par les plantes vertes. P. Mazé (*Compt. rend.*, 1921, **172**, 173-5).—The author elaborates his theory that hydro-xylamine plays a fundamental part in the reduction of CO_2. This compound forms one of the obvious steps by which NH_3 passes to HNO_3, and vice versa, and in nitrifying organisms and in green cells. Reactions are set out by which $NH_2 \cdot OH$ takes part in the chemo- or photo-reduction of CO_2, leading to the production of glycollic aldehyde, which the author has identified in certain leaves.—F. F. B.

WATER RELATIONS

3674. Measurement of the Amount of Water that Seeds cause to become "Unfree." G. T. Bouyoucos and M. M. McCool (*J. Agric. Res.*, 1921, **20**, 587-93).—It was shown by Shull that all dry seeds absorb water from soils with very great force. Investigations were made to discover to what extent seeds, like soils, render water "unfree." The tests were made by the dilatometer method used for soils, and the tests were made at $-3°$ C.; water not freezing at this temperature was considered "unfree." The percentage varied from 26% in spring wheat to 75% in block soy-beans. After repeated freezings and thawings the amount is generally reduced—on soy-beans to 48%. Seeds contain much soluble material; the ground-up meal of spring wheat and of speckled wax beans, when mixed with twice its volume of water, gave freezing-point depressions corresponding to osmotic pressures of 3·4 and 13·3 atmospheres. "The great power that seeds possess to absorb water and abstract it from the soil is partly, if not largely, due to their tremendous osmotic pressure."—V. H. B.

3675. Relation of Moisture in Solid Substrata to Physiological Salt Balance for Plants. J. W. Shive (*J. Agric. Res.*, 1920, **18**, 357-78).—The relation in sand cultures of a water content of 40, 60, and 80% saturation to different salt proportions of NaH_2PO_4, $Ca(NO_3)_2$, and $MgSO_4$ was studied. The effect was practically nil, but the medium degree of moisture with the best "balance of salt proportions" was found to produce the highest yield of tops and roots, a high transpiration rate, and medium water requirements.—V. H. B.

3676. On the Differentiation of the Leaf Tissue Fluids of Ligneous and Herbaceous Plants with Respect to Osmotic Concentration and Electrical Conductivity. J. A. Harris, R. A. Gortner, and J. V. Lawrence (*J. Gen. Physiol.*, 1921, **3**, 343-5).—In the sap of leaves from woody plants the osmotic pressure is higher and the electrical conductivity lower than in that from leaves of herbaceous plants. This is the case with plants from widely different geographical regions and growing under very different conditions of life.—W. S.

RESPIRATION

3677. Comparative Studies on Respiration. XIV. Antagonistic Action of Lanthanum as related to Respiration. Matilda M. Brooks (*J. Gen. Physiol.*, 1921, **3**, 337-42).—Respiration of bacteria was not affected by $La(NO_3)_3$ in a concentration of 25×10^{-6} M; smaller concentrations raised the rate of respiration, higher lowered it, until with a concentration of 0·8 M the respiration is zero. In mixtures of NaCl and $La(NO_3)_3$ respiration is a maximum when the ratio of Na to La is 99·8 to 0·2; with mixtures of $CaCl_2$ and $La(NO_3)_3$ when the ratio of Ca to La is 8 to 2, but the antagonism is less than with Na and La.—W. S.

IRRITABILITY AND MOVEMENT

3678. Sur une tige à géotropisme horizontal. H. Coupin (*Compt. rend.*, 1921, **172**, 608-10).—When various lentils are germinated in the dark, it is found that their stems grow horizontally. If displaced into the vertical position, they exhibit diageotropism, and bend again into a horizontal course. Quite soon after being illuminated, however, the stems proceed to grow upwards in the negatively geotropic way.—F. F. B.

3679. Zur Theorie der sekretorischen Ortobewegung. I. Die Bewegung der Cyanophyceen. H. Prell (*Arch. f. Protistenk.*, 1921, **42**, 99-156).—The author attempts to explain observations already made on movement in Cyanophyceæ from the point of view of mechanical movement through secretion. The product of secretion is the jelly that exudes through pores, evidence of the presence of which has been obtained by Correns and Kolkwitz. For details of the author's theory, reference must be made to the original paper.—W. S.

3680. Light Sensitivity of + and − Strains of Phycomyces nitens. A. F. C. van Dishoeck (*Versl. der Afdeeling Natuurkunde, K. Akad. Wiss. Amsterdam*, 1921, **29**, 667-9).—The two strains examined were obtained from the Central Bureau for Fungus Culture in Amsterdam. The + strain required illuminating for 3 minutes in order to produce a positive phototropic curvature, which occurred 48 minutes after the illumination. The − strain only required illuminating for 35 seconds, while the reaction took place within 10 minutes.—W. S. (*Ber. ü. d. ges. Physiol.*).

FLOWER AND FRUIT FORMATION

3681. Daily Development of Kernels of Hannchen Barley from Flowering to Maturity. H. V. Harlan (*J. Agric. Res.*, 1920, **19**, 393-430). **Development of Barley Kernels in Normal and Clipped Spikes.** H. V. Harlan and S. Anthony (*ibid.*, 431-72).—In the first paper the growth of the Hannchen variety was studied at 12-hour intervals at Aberdeen, Idaho. The size, increase in dry matter, decrease of water, and the carbohydrate and ash increase were all followed. In the second paper it is shown that the removal of the awns from a spike reduces the size and dry weight of the grains. The rachises of the clipped spikes contained about 25% more ash than those of normal spikes, and this seems to explain the tendency of the spikes to "shatter." Barleys that are normally awnless do not give such high yields, and will probably "shatter" more than awned kinds.—V. H. B.

3682. Investigations in the Ripening and Storage of Bartlett Pears. J. R. Magness (*J. Agric. Res.*, 1920, **19,** 473-500).—A study of the changes in the sugars, titratable acid, and of the alcohol-insoluble, acid-hydrolysable, reducing material. The higher the temperature at which the fruit is ripened, the higher the percentage of sugar. —V. H. B.

3683. The Fertilisation of Ophrys apifera. M. J. Godfrey (*J. Bot.*, 1921, **59,** 285-7). —The author states that *Ophrys apifera* is constantly self-fertilised.—C. W.

3684. The Flowers of Tragapogon : their Times of Opening and Shutting. M. Christy (*J. Bot.*, 1921, **59,** 253-7).—At Upsala the opening of the flowers of *Tragapogon pratense* occurs some 3 or $3\frac{1}{2}$ hours earlier than it does in the valley of the Inn, some 13 degrees further south and some 6 degrees further west. The hours of both opening and closing are liable to be varied considerably by the prevailing weather conditions. Roughly speaking, these flowers remain open for no more than about 4 hours out of the 24. Each individual flower opens on more than one day.—C. W.

ENVIRONMENTAL FACTORS

3685. Effect of Relative Length of Day and Night on Growth and Reproduction of Plants. W. W. Garner and H. A. Allard (*J. Agric. Res.*, 1920, **18,** 553-605).—Tests were made at Washington of the effect of shortening the daily period of illumination by placing the potted plants in a dark room during some of the daylight hours. In a number of species it was found that the flowering and fruiting stage was only attained when the length of the period of illumination falls within certain limits, and that consequently these stages of development are reached under ordinary conditions only during certain seasons of the year. With a 12-hour (6 a.m. to 6 p.m.) period of illumination the Biloxi soy-bean took 110 days to blossom, with a 5-hour (10 a.m. to 5 p.m.) it took only 27 days, while a variety of tobacco under similar conditions showed a period of 152 to 162 days and 55 to 61 days respectively. *Aster linarifolius*, with " day " periods of 7 hours and 12 to 15 hours, showed vegetative periods of 36 and 122 days respectively. Under conditions favourable to vegetative growth, but with a length of day not suitable for bringing about reproduction, the phenomenon of gigantism may appear. The distinction between annuals, biennials, and perennials is largely a question of response to the prevailing seasonal range of length of day. This range and its relationship to the prevailing temperatures of the winter largely control seed formation, and hence the natural distribution of the plant. The importance in crop yields of a proper seeding-time depends on the relation of the length of day and proper flowering.—V. H. B.

3686. An Ecological Study of the Algæ of Some Sandhill Lakes. Emma N. Andersen and Elda R. Walker (*Trans. Amer. Micros. Soc.*, 1920, **39,** 51-84).—Climatic factors were measured and biological factors are recorded, and the distribution of algæ correlated with these.—W. S.

3687. Alfalfa Production under Irrigation. G. Stewart (*Utah Agric. Coll. Exp. Stat., Circ.* **45,** 1921, 48 pp.).—Contains a description of the lucerne plant and its varieties, its relation to environmental factors, and details with regard to its cultivation.—W. S.

3688. Zur Kenntnis der Bedingungen der biologischen Wirkung der Röntgenstrahlen. Eugen Petry (*Biochem. Zeit.*, 1921, **119,** 23-44).—Examined sensitiveness of germinating wheat seedlings to Röntgen rays under different conditions and finds that the seedlings are about equally sensitive over a wide range of temperature and under conditions (absence of oxygen, low temperatures, or narcotics) which depress growth and respiration. These findings support conclusion that effect of rays may consist in a purely photo-chemical action upon important substances essential to metabolism.—J. H. P.

THE SOIL

3689. Report of the Results obtained with Reference to the Natural Nitrification of Soils, based upon the Study of Drainage Waters of 1906 and 1907. E. Noriega (*Rev. Agric.*, Columbia, 1919, **5**, 525-60).—W. S. (*Chem. Abstr.*).

3690. Estimation of the Acidity of Humic Soils. S. Odén (*Internat. Mitteil. Bodenkunde*, 1919, **9**, 361-74).—Determination of total acidity of a soil does not show the amount of humic acid, as a number of other acids are present. The H-ion content of soil is determined by the potentiometer method, conc. KCl is added to a portion of the soil, and the H-ion concentration again determined. Acids in filtrate are also estimated by titration, and total acidity and acidity are determined by Tacke method, whereby an indication is obtained of acids present which readily form only slightly soluble Ca salts.—W. S. (*Chem. Abstr.*).

3691. Fungi commonly found in Soil. S. A. Waksman (Proc. Soc. Amer. Bact., *Abst. Bact.*, 1920, **4**, 5).—Soils rich in oganic matter contain abundant growth of fungi under favourable conditions of moisture and temperature. Soils with a low content of organic matter may show growth of fungi under certain conditions. When climatic conditions become unsuitable, the mycelium disappears but the spores remain.—W. S.

3692. Acid Soil Studies. I. A Study of the Basic Exchange between Soil Separates and Salt Solutions. R. H. Robinson (*Soil Science*, 1921, **9**, 353-62).—A study of the action of several salt solutions on the soil separates.—C. W.

3693. Acid Soil Studies. II. Changes in Calcium Compounds added to Acid Soils. R. H. Robinson and D. E. Bullis (*Soil Science*, 1921, **9**, 363-7).—When calcium carbonate or calcium oxide was added to several acid soils, the calcium retained after exposure to the weather for one year was combined chiefly with humus (organic matter) and easily decomposable silicate.—C. W.

3694. Sulphur for Neutralising Alkali Soil. P. L. Hibbard (*Soil Science*, 1921, **9**, 385-7).—From results obtained it is inferred that sulphur added to a soil soon becomes sulphuric acid, which reacts with and neutralises whatever alkaline material may be present. It is suggested that this effect should be of great value in the reclamation of alkali land. The oxidation of sulphur in soil is probably largely due to biologic action.—C. W.

PATHOLOGY

3695. Chlorosis of Lupins on Calcareous Soil. F. Merkenschlager (*Fühling's Landw. Zeit.*, 1921, **70**, 19-24).—Chlorosis is due to poisoning, not to starvation. The chlorosis is not caused by physical properties of the soil, but thorough aeration reduces it.—W. S. (*Chem. Abstr.*).

3696. L'anaphylaxie chez les végétaux. A. Lumière and H. Couturier (*Compt. rend.*, 1921, **172**, 1313-5).—The response to injections of horse serum has been examined with the fleshy leaves and bulbs of monocotyledonous plants. The first sensitising injection consisted of 0·01 to 0·02 c.c. of serum, and no effect was visible. After 3 weeks 0·2 to 0·3 c.c. of serum was injected into sensitised and unsensitised organs. For a few days no response is visible, but from the 4th day the previously sensitised organs begin to wither and die, while the unsensitised remain normal. Typical anaphylaxis can thus be demonstrated in these plants, photographs of which are given.—F. F. B.

3697. A Symbiotic Fungus occurring in the Fat Body of Pulvinaria innumerabilis, Rath. C. T. Brues and R. W. Glaser (*Biol. Bull.*, 1921, **40**, 299-324).—Gives the physiological and morphological characters of the symbiotic fungus which is associated with the cottony maple scale.—C. W.

3698. Treatment of Cereal Seeds by Dry Heat. D. Atanasoff and A. B. Johnson (*J. Agric. Res.*, 1920, **18,** 379-90).—Dry grains of barley, wheat, rye, and oats will bear exposure for 30 hours to a temperature of 100° C. By this means various seed-borne fungal and bacterial diseases can be eliminated.—V. H. B.

3699. Temperature Relations of Certain Potato-Rot and Wilt-producing Fungi, H. A. Edson and M. Shapovalov (*J. Agric. Res.*, 1920, **18,** 511-24).—The growth of *Fusarium cœruleum*, *F. discolor* var. *sulphureum*, *F. eumartii*, *F. oxysporumi*, *F. radicicola*, *F. trichothecioides*, *Verticillium albo-atrum*, was measured at different temperatures on potato agar, using as a measure the diameter of the colonies. *F. oxysporium* and *F. radicicola* have their optimum about 30° C., while the others have their optima near 25° C. The minimum temperature for all of them lay somewhere about 5° C., and the maximum temperature about 30° or 35° C. Germination of *F. trichothecioides* occurred at 30° C., but there was no growth visible to the naked eye. *F. oxysporium* and. *F. radicicola* showed some growth above 35° C., so that the second of these can be distinguished from *F. cœruleum*, which it otherwise resembles, by cultivating at 35° C. A northern strain of *V. albo-atrum* did not grow at 30°, while a southern strain gave a fair growth at 30° C. A correlation can be established between the temperature relations and the geographical distribution and seasonal occurrence of the fungi.—V. H. B.

3700. Versuche zur Bekämpfung des Kartoffelkrebses im Jahre 1918-19. E. Schaffnit (*Zeit. f. Pflanzenkrk.*, 1920, **30,** 59-67).—This paper contains the important statement that certain varieties of potato, which are absolutely immune to wart when produced from vigorous "seed," are susceptible in some degree when derived from degenerate "seed," such degeneration being produced by the incidence of "leaf-roll," "curly dwarf," and similar diseases.—W. B.

3701. Die Typhula-Fäule der Zuckerrüber. E. Molz (*Zeit. f. Pflanzenkrk.*, 1920, **30,** 121-39).—The resting organs (sclerotia) of this fungus are only formed under conditions of high humidity, and then only when a humidity gradient is present. Light is also an accelerating factor.—W. B.

BOOK REVIEWS

Practical Physiological Chemistry. By J. A. Milroy and T. H. Milroy. Third Edition. Pp. 449. Edinburgh: W. Green and Son, Ltd. Price 21s. net.

"The purpose of this book is to meet the needs of both junior and senior students of biology, and also to be serviceable to medical students in their later work." As the work carried out by these students varies from elementary organic chemistry to conduction of simple researches, it follows that the size is increased vastly beyond what would be required were the needs of only one class kept in view. There is of necessity much introductory matter which is an old story to the advanced student, and an almost equally large amount beyond the immediate (and possibly future) needs of the medical student; the result is a bulky volume of some 450 pages, which seems to be enlarged unnecessarily by the incorporation of too many methods; for instance, there are no less than 6 methods for the estimation of urea, and 7 for that of glucose, one of which is admitted to be obsolete. With such a choice of methods the student might well not see the wood for the trees. One cannot but regret that the size of the original work has been so greatly exceeded as to miss the precise needs of the junior student, while at the same time not rivalling the larger handbooks on the subject. Regarding the actual contents of the book, it should be stated that it is well and clearly written, the directions appear ample, and a certain amount of previously unpublished work on

new colour reactions of certain of the purines is incorporated. No mention is made of the chemistry of respiration (for reasons explained in the preface), although several pages are devoted to various methods of oxidising polyhydroxy alcohols and to detailed preparations of some glucosides. The chapter on fats and allied substances is on a less ambitious scale than most of the others. Directions for carrying out some physical methods of value in biological chemistry are given in some detail, and the chapter on the application of polarimetric methods in biology is excellent. One always welcomes a book of real merit, and into this class the book of the brothers Milroy (J. A. Milroy is in the main responsible for the revision) undoubtedly falls. The preceding criticisms and suggestions are only intended to help the authors when they are considering a new edition.—J. A. H.

An Introduction to Biophysics. By D. Burns Pp. 435. J. and A. Churchill, 1921. Price 21s. net.

We are aware of no work which approaches this subject from quite the same point of view as the one under notice. Professor Burns examines the various problems of physiology exclusively through the eyes of the physicist. No pretence is made that the book is a "treatise" on the subject, but, on the other hand, the term "introduction" is modest. The whole is an excellently written application of the fundamental laws of physics to physiological phenomena, and attempts to show how many of the reactions of living matter can be interpreted without the aid of processes other than physico-chemical. In view of the differences of opinion as to how far these reactions can be so explained, we venture to think that a review of this nature is all the more welcome, and we recommend it strongly, not only to students reading for higher examinations, but also to physiologists in general who are interested in this aspect of the subject. It should be pointed out, however, that it is "problems of vertebrates rather than the basic problems of life that are dealt with." The author is to be congratulated on this truly excellent book.—J. A. H.

Handbuch der biologischen Arbeitsmethoden. Edited by E. Abderhalden. Urban and Schwarzenberg, Berlin and Wien.

This is the title of the new edition of the well-known "Handbuch der biochemischen Arbeitsmethoden," which is now appearing. The scope of the work is greatly extended, and 9 Lieferungen have already appeared.—C. L. E.

Technique of the Teat and Capillary Glass Tube. By Sir A. E. Wright and L. Colebrook. Pp. xxvi+384. Constable, London, 1921. Price 42s.

The capillary glass tube has extensive uses in the hands of bacteriological workers. Physiologists should know more of the possibilities of this method which Sir Almroth Wright has worked up to the state of a remarkably comprehensive technique. The present volume is essentially one dealing with practical methods, which are very fully described and illustrated, so that the directions are unmistakable.—C. L. E.

Experimental Rickets. By E. Mellanby. [Medical Research Council. Special Report Series, No. 61. London: H.M. Stationery Office, 1921. Price 4s. net.]

A valuable contribution which should be read in the original. Most of the work centres on the part played by diet, exercise, and confinement in the production of experimental rickets in puppies. The most potent of the anti-rachitic fats is cod-liver oil; butter and suet also influence calcification. Of the vegetable oils peanut and coconut are best. The potent principle of fats is probably the vitamin A, but anti-rachitic factors appear to be present also in lean meat. Excessive bread in diets deficient in anti-rachitic substances is especially harmful. The experiments on milk diets still leave many important questions unanswered, and also raise others; it is

stated that the Ca-fat-protein balance in normal milk is of importance—a discovery of some consequence, if substantiated by further work. Inadequate Ca intake is a possible factor of importance in exaggerating the condition of rickets; milk, egg yolk, and green vegetables are rich in Ca. Exercise is of little importance. There are 129 figures, photographs, microphotographs, and radiograms, the latter being excellent.—C. L. E.

OBITUARY

PROFESSOR F. A BAINBRIDGE

By the untimely death of Francis A. Bainbridge, M.D., F.R.S., at the age of forty-seven, English physiology has to deplore the loss of one of its most active workers.

At the time of his death, Bainbridge was University Professor of Physiology at St. Bartholomew's Hospital.

His physiological work was many-sided. His researches on lymph formation, with especial reference to the part played by the tissues in this process, represent a permanent contribution to our knowledge of the subject. The mechanism of urinary secretion was also a favourite study of his, and in his latest work he brought forward many new arguments in favour of glomerular filtration and the absorptive function of the tubules. In addition to an investigation of the movements of the gall-bladder and their innervation, he was keenly interested, especially in later years, in the physiology of the circulation, and his discovery that any rise of pressure on the venous side of the heart causes reflexly a quickening of the beat is one of fundamental importance.

Bainbridge was the author of a popular students' textbook of physiology, and of an admirable monograph on the physiology of bodily exercise.—E. H. S.

H. K. LEWIS & CO. LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

3702. Permeability. H. J. Hamburger (*Lancet*, 1921, ii., 1039-45).—A lecture delivered before the University of London a few months ago. It not only summarises the author's work in a terse and clear way, but points out how permeability of cells is a factor in many physiological and pathological problems. The diagram on page 1044 will be found most helpful to teachers.—W. D. H.

3703. Über die drei ersten Lebensmonate eines Schimpansen. G. J. von Allesch (*Sitz. d. preuss. Akad. d. Wiss.*, 1921, **39,** 672-85).—The behaviour of a mother chimpanzee to its offspring during the first three months after its birth, and the way in which the offspring was taught to perform actions necessary for its future existence and welfare, are fully recorded.—D. H. de S.

3704. Über Cetacea—I. Y. Morimoto, M. Takata, and M. Sudzuki (*Tohoku J. Exp. Med.*, 1921, **2,** 258-86).—Mainly of general biological interest; deals with mode of breathing and morphology of lungs, alimentary tract, and kidneys. Some observations may be noted. The nose is purely respiratory. The blood contains erythrocytes of large size (8 to 10 μ), and a low percentage of polymorphs. The stomach is trichambered, the first being lined by stratified epithelium, the second containing typical fundus glands, and the third showing pyloric glands; all three parts, however, exhibit a proteolytic ferment. There is no gall-bladder.—R. K. S. L.

3705. Etude d'un coefficient de réduction organique apprécié par l'élimination du bleu de méthylène. Les variations selon les régimes. E. Schulmann and L. Justin-Besançon (*Compt. rend. soc. biol.*, 1921, **85,** 774-6).—If methylene blue is injected into the human organism, it is completely transformed to a colourless chromogen in the blood. When excreted in the urine it reappears in part as methylene blue. The authors study this re-oxidation by the kidney. They inject 1 c.c. of 5% methylene blue and study hourly urines. The blue of the urine is compared colorimetrically against the blue obtained when the urine is fully oxidised. Thus they obtain a "coefficient of reduction," expressing the proportion of reduced methylene blue excreted. A diet of excess of sugar delays elimination and oxidation, while excess of nitrogen in the diet has the opposite effect. A rich salt diet diminishes the oxidising power of the kidney.—J. H. B.

3706. Electrical Signs of the Human Body. M. C. Potter (*Brit. Med. J.*, 1921, ii., 689-90).—The E.M.F. of the body has been found to be subject to great fluctuations in the same person, and between different individuals. Thus, in a class of 29 students, 10 exhibited a negative and 19 a positive reaction. In the same individual the E.M.F. has been found to vary from 10 volts negative to 3 volts positive, with certain neutral points. The breath has been found to be negative in normal cases.—D. H. de S.

3707. On Inheritance of Finger-Print—I. E. M. Elderton (*Biometrika*, 1920, **13,** 57-91).—A classification of finger-prints into 5 chief groups is made, and it is shown that the correlation coefficient for the inheritance of any particular pattern is about 0·3, slightly less than for most physical characters. This may be due to the fact that only one finger was examined, while in some cases the pattern under investigation might have been displayed by another digit. The sex correlation, which also appears,

may have been due to the particular choice of material.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3708. La répartition du zinc dans l'organisme du poisson. M. Bodansky (*Compt. rend.*, 1921, **173**, 790-2).—The author has worked on the catfish (*Ailurichtys marinus*), which contains a large proportion of zinc, and the red snapper (*Lutjanus arga*), which contains such a proportion as is found normally in animal tissues. In the red snapper the greatest accumulation of zinc (about 50 mg. per kilo of the fresh tissue) is found in the liver and spleen. In the muscles it is about 2 mg. per kilo. In the catfish also the greatest total amount of zinc is found in the liver, but the greatest percentage in the skeleton. The muscular tissues here also contain little zinc.—Ha. W.

APPARATUS

3709. The Preparation and Standardisation of Collodion Membranes. A. G. Eggerth (*J. Biol. Chem.*, 1921, **48**, 203-21).—By altering the proportion of alcohol and ether in the solvent, collodion membranes of varying degree of permeability can be readily prepared. The properties of different membranes are described.—T. A. W.

3710. The Hot Wire for Investigating the Pulse and Voluntary Contraction in Man. A. V. Hill (*Brit. Med. J.*, 1921, ii., 686-7).—The methods employed and the results obtained have been published previously (see Abstracts Nos. 2591, Vol. V., p. 411; and 2097, Vol. VI., p. 302).—D. H. de S.

3711. An Automatic Pipetting Device. W. F. Lorenz (*J. Lab. and Clin. Med.*, 1921, **7**, 54-7).—The apparatus is figured and described. It is recommended for any technical procedure where constant amounts of fluid are to be measured, and delivered at intervals and at a controllable speed.—D. H. de S.

3712. Technique for Inspiration-Expiration Ratios. H. E. Burtt (*J. Exp. Psychol.* [Amer.], 1921, **4**, 106-10).—The author previously described a method for obtaining the I/E ratio in which one electric circuit was closed during inspiration and another during expiration (Abstract No. 105, Vol. IV., p. 22). He now describes an improved device with a figure (without which detailed description is impossible) which eliminates the reading of records on a kymograph, and saves much time, but is accurate. The ratio evidently is the time ratio of the 2 events, though the author does not explicitly say so. He, however, does say his apparatus is of no use in estimating the amplitude of breathing.—W. D. H.

3713. Apparatus for the Rapid Estimation of Nitrogen in Blood and Urine. C. E. Reyner (*J. Lab. and Clin. Med.*, 1921, **7**, 53-4).—D. H. de S.

ANALYTICAL METHODS

3714. Estimation of Small Quantities of Zinc in Foods. M. Bodansky (*J. Ind. Eng. Chem.*, 1921, **13**, 696-7).—Analytical chemistry.—W. D. H.

3715. Estimation of Sodium, Potassium, Calcium, and Magnesium in Urine and Stools. F. F. Tisdall and B. Kramer (*J. Biol. Chem.*, 1921, **48**, 1-12).—Na is determined by precipitation with potassium pyro-antimoniate after removal of Ca and Mg by the usual methods. K and Ca are estimated by the same methods as those previously described for serum (see Abstract No. 710, Vol. VI., p. 109). Mg is estimated by a modification of Stolla's method.—T. A. W.

3716. Direct Estimation of Sodium, Potassium, Calcium, and Magnesium in Small Amounts of Blood. B. Kramer and F. F. Tisdall (*J. Biol. Chem.*, 1921, **48**, 223-33).—

The blood is freed from protein by trichloracetic acid, and the estimations are made in the filtrates by modifications of methods previously described by the authors (see preceding abstract).—T. A. W.

3717. Rapid Estimation of Urea in Urine, Blood, and Other Fluids. H. Strohmann and S. Flintzer (*Zentr. inn. Med.*, 1921, **42**, 545-62).—An examination of the methods of Folin and his co-workers. Difficulties in the hydrolysis by means of urease may be avoided by using smaller amounts of material and working at greater dilutions. On account of the errors consequent on the small amounts of nitrogen to be estimated, the older method of Marshall was tried. It gave more concordant results, but demanded longer time. The method to be adopted for the preliminary removal of protein will vary according to the liquid under examination and the amount of protein present. —W. D. H. (*J. C. Soc.*).

3718. Calcium in the Blood. Methods of Jansen and of Marriott and Howland. H. Labbé and G. de Toni (*J. Pharm. Chim.*, 1921, [vii.], **24**, 247-55).—Both methods of estimation were found unsatisfactory.—W. D. H. (*J. C. Soc.*).

3719. Estimation of Uric Acid in Blood. P. Biffi (*Riv. osp.*, **11**, 29-40).—The methods of Ludwig-Salkowski, Schittenhelm-Schneller, Kowarski (piperidine), and Aufrecht (hydroxyl) estimation of ammonium urate were compared. The agreement was unsatisfactory, but the first two gave the most concordant results. The second method would appear to be the most trustworthy. A modification of the Kowarski method was less accurate.—W. D. H. (*J. C. Soc.*).

3720. Rapid Estimation of Hippuric Acid in Urine. F. B. Kingsbury and W. W. Swanson (*J. Biol. Chem.*, 1921, **48**, 13-20).—50 c.c. of urine are treated with 7·5 gm. of NaOH and 0·5 gm. MgO and boiled till the volume is 25 c.c.; 1 c.c. of a 7% solution of potassium permanganate is carefully added, together with 30 c.c. conc. nitric acid, and the mixture boiled for a further 30 mins. under a reflux condenser. The benzoic acid is extracted with chloroform, and after suitable washing is titrated with standard sodium ethylate solution, using phenolphthalein as an indicator.—T. A. W.

3721. Estimation of Sugar in Normal Urine. S. R. Benedict and E. Osterberg (*J. Biol. Chem.*, 1921, **48**, 51-7).—The urine is treated with animal charcoal and filtered. The filtrate is heated with picric acid, sodium hydrate, and a little acetone on the water bath; the colour developed is compared with a standard sugar solution treated similarly. The acetone destroys the colour produced by creatine, creatinine, and alkaline picric acid, but not that due to glucose. Various precautions have to be taken to ensure accuracy. The authors state that the reduction of picric acid by glucose does not produce picramic acid, as is usually supposed.—T. A. W.

CHEMICAL

3722. On the Numerical Values of the Optical Rotations in the Sugar Acids. P. A. Levene (*J. Biol. Chem.*, 1921, **48**, 197-202).—Purely chemical.—T. A. W.

3723. Phosphoric Esters of Some Substituted Glucoses and their Rate of Hydrolysis. P. A. Levene and G. M. Meyer (*J. Biol. Chem.*, 1921, **48**, 233-48).—Of purely chemical interest.—T. A. W.

3724. Mytilitol, a Naturally Occurring Cyclose. D. Ackermann (*Ber. deut. chem. Ges.*, 1921, **54B**, 1938-43).—The isolation and properties of mytilitol from *Mytilus edulis* is described in detail. It is scarcely conceivable that an isomeride of quercitol would exhibit some of the properties described.—W. D. H. (*J. C. Soc.*).

3725. Diffusion of Food Materials, Enzymes, and Pro-Enzymes. Alma J. Neill (*Amer. J. Physiol.*, 1921, **57**, 468-95).—Addition of bile increases the rate of passage of

fats and fatty acids through a particular collodion membrane. Glycerol diffuses more rapidly than fatty acids or their soaps, monosaccharides more rapidly than disaccharides, and these than polysaccharides. As a rule, the more powerful saline cathartics diffuse less rapidly than the less powerful, but there are exceptions. Glycine diffuses more rapidly than alanine, and acetic acid than propionic. Urea was the most diffusible of all the substances tested. Catalase, ptyalin, and pepsinogen did not diffuse through the membrane used, whereas trypsin, trypsinogen, and pepsin did. Trypsin was more diffusible than trypsinogen. But it is to be remembered that we do not know whether these "enzymes" were the pure substances, and not enzymes absorbed by other substances.—W. M. B.

3726. The Fat of the Horse. A. Heiduschka and A. Steinruck (*J. pr. Chem.*, 1921, **102,** 241-66).—The material under investigation was obtained from the various fatty tissues. The total fatty acids are composed of linolenic acid 1·69, linolic acid 6·68, oleic acid 55·24, stearic acid 6·82, palmitic acid 29·47%. In addition, 0·426% of unsaponifiable matter, mainly cholesterol, is present. Constants are set out in detail. —W. D. H. (*J. C. Soc.*).

3727. Glycerides of Goose Fat. C. Amberger and K. Bromig (*Pharm. Zentr.-h.*, 1921, **62,** 547-8).—Goose fat, when kept for some time, deposits about 15% of solid fat containing α-stearodipalmitin and β-stearodipalmitin. The liquid portion of the fat consists chiefly of triolein. Constants are given.—W. D. H. (*J. C. Soc.*).

3728. Mutton-Bird Oil—I. C. L. Carter (*J. Soc. Chem. Ind.*, 1921, **40,** 220T).—This oil is extracted from the stomach of an Australian petrel, *Æstrelata lessoni*. It resembles sperm oil very closely in its physical and chemical properties. The alcohols obtained by saponification of the oil consist chiefly of cetyl alcohol, and the greater portion of the mixed fatty acids consists of oleic acid. There is evidence of the presence of acids of the linolic or linolenic series.—W. D. H. (*J. C. Soc.*).

3729. La dégradation des acides gras dans l'organisme animal. P. Waringer (*Bull. soc. chim. biol.*, 1921, **3,** 311-450).—An exhaustive review of previous work and theories. As the author says, definite conclusions must be drawn with precaution. The classified bibliography, which extends to more than 50 pages, will be found most useful.—W. D. H.

3730. Composition and Characters of Brain Cephalin. F. Fenger (*J. Pharm. Expt. Ther.*, 1921, **18,** 51-62).—A method of preparing cephalin and measurements of its thromboplastic activity are given. Brain cephalin contains K and Na as soaps in combination with some of the fatty acids constituting the phosphatide. Both the solubility of cephalin in water and its thromboplastic properties depend on the presence of these soaps. K, Na, and a faint trace of Fe were the only inorganic bases found in the samples of cephalin examined.—J. A. G.

3731. Estimation of Creatinine in the Presence of Acetone and Diacetic Acid. N. F. Blau (*J. Biol. Chem.*, 1921, **48,** 106-18).—Acetone, ethylaceto-acetate, and diacetic acid interfere with the estimation of creatinine by Folin's method. They are removed by making the urine faintly acid, diluting with methyl alcohol (5 vols.), and heating for 5 mins. The diacetic acid is converted into acetone and boiled off; the methyl alcohol aids this, and is without effect on the subsequent determination of creatinine with picric acid.—T. A. W.

3732. Synthesis of Inactive Para- and Anti-hydroxy Aspartic Acids (Amino-malic Acid). H. D. Dakin (*J. Biol. Chem.*, 1921, **48,** 273-91).—The importance of hydroxy amino-acids in protein chemistry may be considerable. Hence it is necessary to investigate them. The present contribution is purely chemical.—W. D. H.

3733. The Structure of Thymus Nucleic Acid. P. A. Levene (*J. Biol. Chem.*, 1921, **48,** 119-25).—A criticism of Jones's theory of structure of nucleic acids. A description of the preparation of a crystalline barium hexothymidin diphosphate from commercial nucleic acid is given.—T. A. W.

ENZYMES

3734. Mechanism of Enzyme Action exemplified by Pepsin. J. H. Northrop (*Science*, 1921, **53**, 391-3).—A typical enzyme (pepsin) action is explicable by the laws of chemical action. Apparent divergencies are due to the enzyme and substrate being in solution, and in this solution there are free and combined pepsin, ionised and non-ionised protein. The action takes place between free pepsin and ionised protein.—W. D. H.

3735. Nouveau procédé pratique pour le dosage de la pepsine. M. Takata (*Tohoku J. Exp. Med.*, 1921, **2**, 127-30).—A modification of the Grützner-Roaf method, employing 5% fuchsin S. This dye hinders proteolysis less than either carmine or Congo red, and does not precipitate in an acid medium.—R. K. S. L.

3736. Natur und Entstehung diastatischer Fermente. E. Rothlin (*Münch. med. Woch.*, 1921, **68**, 1393-5).—Biedermann has studied the acceleration of diastatic activity by salts, and has concluded that salts have the power of setting up a fermentative process in an amylose solution which is entirely free from enzyme. The author of this paper has investigated this conclusion, and considers that the action described by Biedermann is a bacterial action, and not a fermentative process.—J. H. B.

3737. Über das proteolytische Serumferment. R. Stephan and E. Wohl (*Zeit. f. d. ges. exp. Med.*, 1921, **24**, 391-406).—By heat inactivation the inhibiting effect of the serum on the action of trypsin on fibrin is annulled. The active serum has no proteolytic effect, although in the normal serum there is a proteolytic enzyme (contrary to Abderhalden). The problem is to annul the colloidal inhibition action of the serum without interfering with the activity of this ferment. Heat inactivation of the serum gives positive results in some cases. Digestion of carmine fibrin and other methods were tried with partly positive results. All methods which make fibrinolysis by the serum enzyme possible annul also the complement effect of the serum in the hæmolytic system.—H. W.

3738. On Blood Ferments. J. Grönberg (*Furska Läk. Handl.*, 1921, 429-72).—A series of observations carried out by Abderhalden's dialysis method, which support his views on protective enzymes.—W. D. H.

PHYSIOLOGY OF INVERTEBRATES

3739. Thermal Death-Points of Encysted Protozoa. W. C. Boeck (*Amer. J. Hygiene*, 1921, **1**, 365-87).—The temperature necessary to kill protozoa when encysted was estimated by the eosin criterion of viability, and is thus stated for the following organisms: *Entamœba histolytica*, 66° to 68°; *Entamœba coli*, 74° to 76°; *Iodamœba bütschlii Endolimax nana*, *Giardia intestinalis*, 62° to 64°; and *Chilomastix mesnii*, 70° to 72° C. The high temperature necessary to kill these parasites is parallel to that needed to kill bacterial spores.—W. D. H.

3740. Conjugation in Races of Paramœcium. H. S. Hopkins (*J. Exp. Zool.*, 1921, **34**, No. 3).—Much space is given to descriptions of diversities among over 20 strains. Conjugation is determined by the combined action of external and internal factors. —W. D. H. (*W. I.*).

3741. Micronucleate and Amicronucleate Races of Infusoria. L. L. Woodruff (*J. Exp. Zool.*, 1921, **34**, No. 3).—Discovery of amicronucleate races of *Oxytricha fallax*, *Urostyla grandis*, and *Paramœcium caudatum*. Discussion of the function of micronucleus and macronucleus. Possible method of origin of amicronucleate races. Amphinuclei. —*Author's Abstract* (*W. I.*).

3742. Uroleptus mobilis. IV. Effects of Cutting during Conjugation. G. N. Calkins (*J. Exp. Zool.*, 1921, **34,** No. 3).—Conjugating individuals of *Uroleptus mobilis* were severed prior to nuclear interchange. One individual was fixed and stained to determine the stage of conjugation, the other was kept alive in fresh medium. Out of 30 successful operations, all fragments regenerated and underwent reorganisation. This occurs regardless of the stage in conjugation; 7 of these fragments completed full life-cycles. Individuals recently mated and shaken apart undergo the same reorganisation processes. As with normal ex-conjugants, the cut fragments give rise to progeny the vitality of which depends on the age of the parents, but in all but one case this vitality was lower than that of the normal ex-conjugant control, and in all cases lower than that of the parents.—W. D. H. (*W. I.*).

3743. Über den Farbstoff den Seeohrs. T. Kodzuka (*Tohoku J. Exp. Med.*, 1921, **2,** 287-9).—The pigment of the shells of the univalve *Haliotis gigantea* contains 45% C, 6·9% H, and 11·8% N, and is a pyrrol derivative.—R. K. S. L.

3744. Amitosis in the Ciliated Cells of the Gill Filaments of Cyclas. F. Helvestine, Jr. (*J. Morph.*, 1921, **36,** No. 1).—Non-ciliated cells of the basal epithelium give rise to the ciliated cells of the lateral, laterofrontal, and frontal epithelium. Mitosis occurs in the cells of the basal epithelium and in non-ciliated cells of the gut. Amitosis is the exclusive method of proliferation of the ciliated cells of the gill filaments. By amitotic division the parent cell of the laterofrontal epithelium produces transitional cells, from which are formed cells to replace the worn-out cells of the frontal epithelium. No centrosome can be demonstrated in the ciliated cells of Cyclas, and no genetic relationship is discernible between mitochondria and the cilia. Indirect evidence points to the conclusion that the basal bodies of ciliated cells are centrosomal derivatives.—W. D. H. (*W. I.*).

3745. Experimental Control of Organic Polarity by the Electric Current. E. J. Lund (*J. Exp. Zool.*, 1921, **34,** No. 3).—Internodes cut from *Obelia commissuralis* possess and retain an inherent polarity, according to which regeneration of a hydranth occurs at the apical end before that at the basal end. The inherent normal polarity may be reversed by means of an electric current. The establishment of an electrochemical polarity is probably a primary condition for the development of morphological polarity, because the physiological mechanism which determines morphological polarity can be controlled and directed by an electric current of external origin.—W. D. H. (*W. I.*).

3746. Étude cytologique et microchimique des hématies cœlomiques de la Terebella lapidaria. M. Romieu (*Compt. rend.*, 1921, **173,** 786-8).—Cœlomic corpuscles are only present in the perivisceral lymph. In *T. lapidaria* the form of these corpuscles is very constant, and is a perfectly circular biconvex disc. They are capable of stretching and shrinking in passing through narrow places, returning quickly to the original form. The diameter varies from 15 to 20 μ. The nuclei are only visible after fixation, and are only feebly chromatic. They often show amitosis. Nothing resembling division of the cytoplasm has been seen. The cell bodies are surrounded by a fine membrane, and the contents are coloured deep yellow by hæmoglobin. Two varieties of granules have been observed in the cell: the granules of the one kind are colourless, numerous, and give the reactions for fats; the other granules are less numerous, and of a deep red-brown colour; the author concludes that they are composed of purine bodies, and are probably of an excretory nature.—Ha. W.

3747. Tropismes et tonus musculaire. E. Rabaud (*Compt. rend.*, 1921, **173,** 606-8).—Experiments have been carried out with spiders. A vibrating tuning-fork was placed on the upper border of the web in the prolongation of the longitudinal axis of the body, the animal thus receiving symmetrical stimuli. It rotated through 180°, and moved towards the tuning-fork, with the cephalothorax in front. The 2 anterior legs of one

side were then amputated in several individuals, and the experiment repeated; the same results were obtained, though, according to the classic theory, the animals should turn indefinitely in a circle. Some acridians were put into a tube so placed that they looked away from the sun, at the same time receiving exactly symmetrical stimuli. These insects also rotated through 180°. Next an eye was varnished and the insects replaced in the initial position; they again turned through 180°, and stopped facing the sun. Experiments with diptera show that luminous stimuli affect particularly the leg muscles, so that after varnishing one eye they walk in circles, but their flight is unaltered. The author considers that there are two distinct reflexes, one of translation and the other of direction, and that these do not affect the same muscles.—Ha. W.

3748. Blue-Green Caterpillars. J. H. Gerould (*J. Exp. Zool.*, 1921, **34,** No. 3).—A study in origin and ecology. The progeny of a white caterpillar (*C. philodoce*). The blue colour of the hæmolymph is recessive. The colour in the hæmolymph of the green mutants, which are unmolested by sparrows, is attributed to a yellow (xanthophylloid) and a blue-green pigment, both derived from the chlorophyll of the food. The mutant gene attacks the former and leaves the latter intact. Many other details interesting to those who study genetics are added.—W. D. H. (*W. I.*).

CELLS AND TISSUES

3749. Cytological Nomenclature. E. V. Cowdry (*Anat. Rec.*, 1921, **22,** No. 4).—The multiplicity of cytological terms is viewed with apprehension. Some are introduced to indicate morphological attributes; others to designate ideas relative to chemical constitution; still others to call to mind original discoverers; while the most confusing are devised to proclaim some theoretical functional interpretation. The confusion is prejudicial to clear thinking, and definitely retards the progress of cytology; but it will grow worse until investigators become alive to the situation to regard the introduction of new terms, without good and sufficient reasons, as a kind of misdemeanour. Some measure of conservatism is needed.—W. D. H. (*W. I.*).

3750. Protoplasmic Viscosity Changes during Mitosis. L. V. Heilbrunn (*J. Exp. Zool.*, 1921, **34,** No. 3).—An attempt was made to determine the magnitude of these changes. The centrifuge method of measuring protoplasmic viscosity was used. Most measurements were made on the egg of the lamellibranch Cumingia. Eggs were centrifuged at short intervals during the time that elapses between fertilisation and cleavage. The velocity of granular movement under the influence of a given centrifugal force was taken as a measure of the protoplasmic viscosity. In both maturation divisions and cleavage appearance of the spindle is preceded by a sharp viscosity increase, and followed by a sharp viscosity decrease. At the conclusion of mitosis, just before the cell divides, the viscosity increases markedly. Measurements were obtained and the results plotted. In the egg of the annelid Nereis viscosity changes are similar.—W. D. H. (*W. I.*).

3751. Sodium Distribution in Cells. S. Funcoka (*Kyoto Igaku Zasshi*, 1918, **15,** 89-120; *Jap. Med. Lit.*, 1921, **6,** 2).—By various microchemical methods Na was found in blood-plasma, but not in red cells; in the lymph of muscle, but not in the fibres; in cartilage matrix, but not in the cells. In plants Na was found in the cell plasma, but not in nuclei or in chlorophyll bodies.—W. D. H. (*Chem. Abstr.*).

3752. Histochemical Demonstration of Purines. E. Bauer (*Virchow's Arch.*, 1920, **228,** 526-32).—By the Courmont method, the author claims he can demonstrate purines to exist within the cells of most animal tissues. He contends that iron-free pigment and " wear-and-tear " pigments in cells are purine derivatives.—W. D. H. (*Chem. Abstr.*).

3753. Über die Permeabilität der Zellen und Gewebe—VIII. H. Schaeppi (*Biochem. Zeit.*, 1921, **122,** 232-50).—The distribution of $BaCl_2$, choline bromide, and nicotine between corpuscles and plasma or serum was determined by a physiological method, using Führner's nerve-free leech preparation. The corpuscles are impermeable to barium, but nicotine and choline both distribute themselves equally in the corpuscles and serum or plasma.—H. K.

3754. Exosmosis from Animal Cells. J. Gray (*J. Physiol.*, 1921, **55,** 322-5).—The absolute rate of exosmosis from different eggs of the rainbow trout varies. In the initial phase the cell membrane is destroyed; the length of this phase depends on the resistance of the individual cell and the strength of the toxic solution. After the initial phase the electrolytes diffuse out of the cell according to simple diffusion laws.—J. A. C.

3755. Sur un mécanisme cinétique nouveau: La mitose syndinenne chez les peridiniens parasites plasmodiaux. E. Chatton (*Compt. rend.*, 1921, **173,** 859-62).—In the nuclear division of syndinium 10 filaments are observed which diverge from one pole, forming a half-spindle. The author is now convinced that each filament is only a half-chromosome. The pole of the half-spindle is composed of the apices of 5 angles, the sides of which are the 10 filaments. There are thus 5 long chromosomes folded in an acute V. These divide longitudinally, forming 10 V-shaped chromosomes; 5 remain grouped together, and the other 5 gradually diverge and group themselves round the opposite pole. In certain syndiniums the divided chromosomes remain adherent by their free extremities, round which the 2 halves swing as round a hinge, finally putting themselves in opposition. Thus there is formed a bipolar spindle which has the appearance of being divided across the middle. There is no definite centrosome or achromatic spindle, so that mitosis in these organisms is of a very simple type.—Ha. W.

3756. Über die Natur der basophilen Erythrozytengranula. C. Kreibich (*Berlin. klin. Woch.*, 1921, **58,** 695-6).—These granules are stated to arise from the nucleus.—W. D. H.

3757. The Vitally Stainable Granules as a Specific Criterion for Erythroblasts, and the Differentiation of the Three Strains of the White Blood-Cells in the Yolk Sac of the Chick. Florence R. Sabin (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 314-21).—The title is an epitome of the paper.—W. D. H.

3758. Sur la chromophilie de la granulation dite azurophil. L. M. Betances (*Compt. rend.*, 1921, **173,** 609-11).—Films of human and guinea-pig's blood have been stained with the methyl green pyronine mixture of R. Neveu Scr., and with a concentrated watery solution of safranin. The results show that the so-called azurophil granulation is stained also by pyronine and safranin. Its coloration of more or less brownish-orange by these red dyes appears to prove that in its constitution there is a preponderance of acid groupings which give it a true basophil character. It is proposed that it should be called the granulation dzeta.—Ha. W.

3759. Ingestion of Melanin Pigment Granules by Tissue Cultures. D. T. Smith (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 240-4).—Melanin granules prepared from urine were ingested by connective tissue cells, cells of liver, kidney, lung, retina, endothelium, and others, but not by red corpuscles, muscle fibres, and nerve cells. There are differences between the granules produced in and ingested by cells; the former are never clumped together.—W. D. H.

3760. Growth of Fibroblasts and Hydrogen-Ion Concentration of the Medium. A. Fischer (*J. Exp. Med.*, 1921, **34,** 447-54).—The optimum is at P_H 7·4 to 7·8; more acid reactions are especially harmful, though a few generations can be grown even at P_H 5·5. —C. L. E.

3761. Das Glykogen in dem Vorhof-Kammer-Leitsystem. P. Rojas (*Rev. iberoamer de cienc. méd.*, 1920, **44,** 110-6). **Das Glykogen in dem Vorhof-Kammer-Leitungssystem.** P. Rojas (*Semana méd.*, 1920, **27,** 591-5 [Spanish]).—Description of stained

preparations demonstrating the abundant glycogen of the Purkinje tissue. In the fœtal heart the glycogen content of these cells is the same as that of the general myocardial fibres.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3762. Glycogen Granules in Skeletal Muscles. S. Takenuchi (*Iji Shimbun*, 1918, No. 996, 533-43; *Jap. Med. Lit.*, 1921, **6,** 13).—Study was made of the number and distribution of the glycogen granules in the muscles, myocardium, liver, and kidney of 200 cadavers. The number of granules did not change during the first 12 hours after death, but decreased progressively thereafter. The number was greater in the spring and autumn than in summer and winter, was lower in children than in adults, and showed no sexual difference. Glycogen was most abundant in the gastrocnemius; less in the rectus abdominis, diaphragm, and intercostal muscles; and least in the masseter muscles and those of the arm. It was still present in the muscle in numerous diseases.—W. D. H. (*Chem. Abstr.*).

3763. Subepithelial and Glycogen Cells in Embryo and Recently Hatched Fish. F. W. Ellis (*Science*, 1921, **53,** 418-20).—Cells appear about the 6th day after the first division of the egg of *Perca flavescens*, and are shown by staining with iodine. Blood-cells appear a day or two later, and in a few more days the liver is formed. The latter stains brick-red with iodine. The liver cells do not contain glycogen. As development proceeds the number of glycogen cells is lessened by absorption, though their entire disappearance was not observed. Glycogen cells were found in most species of fish, but not in the recently hatched smelt or in *Fundulus*. It is suggested that these cells can be isolated and cultivated in artificial media.—W. D. H. (*Chem. Abstr.*).

3764. Distribution of Potassium in the Electric Organ of the Thorn-Back (Raja clavata). M. W. Woerdeman (*Proc. Acad. Sci. Amsterdam*, 1921, **23,** 842-7; *Verslag Akad. Wete. Amsterdam*, 1921, **29,** 567-72).—The electric organ is derived from voluntary muscle, and consists of platelets imbedded in jelly-like connective tissue. Frozen sections were cut and stained by Macallum's methods. K was found in both anterior and posterior cortical layers, and in the inner layer. The electrolemma was apparently free from K. Stress is placed upon: (1) The abundance of K in the electric platelets and the slight amount of K in the surrounding jelly; (2) the occurrence of a large precipitate of K on the boundary between the anterior cortical layer and the inner layer; (3) the occurrence in the inner layer of the peculiar distribution of K compounds, which is characteristic of voluntary muscle.—W. D. H. (*Chem. Abstr.*).

3765. Changes in Golgi's Apparatus produced by Cold in Spinal Cells. C. da Fano (*J. Nerv. and Ment. Dis.*, 1921, **53,** 353-60).—Exposure of rats to moderate cold causes in the spinal nerve cells the Golgi apparatus to become at first more robust in appearance, and then to break up into variously arranged masses. This is accompanied by the appearance of canaliculi in the cells (Holmgren's trophospongium). Extreme cold, which considerably lowers the body temperature, produces almost complete disintegration of the apparatus.—W. D. H.

3766. Golgi's Apparatus in Transplantable Tumour Cells. C. da Fano (*Scient. Rep. Imp. Cancer Fund*, 1921, **7,** 67-91).—The apparatus in malignant cells assumes a characteristic aspect, which persists after successive regraftings. The details of the changes (fragmentation, hypertrophy, etc.) must be read in the original (13 plates). The apparatus differs from chondriosomes and from so-called trophospongium, but its function is as yet unknown.—C. d. F.

3767. Über Resorptionsverhältnisse der Haut und ihre expeditive Prüfung. R. Latzel and K. Stejskal (*Wien. klin. Woch.*, 1921, **34,** 496-8).—The normal absorption time of 40 c.c. 0·6% NaCl solution after subcutaneous injection was determined. This time is lessened by injections of hypertonic salt solutions in the state of fever artificially produced, and by irradiation of the skin.—H. W.

3768. Über den Abtransport des Hautpigments. Ein Beitrag zur Frage des Ursprungs des Cutispigments. H. Meyer (*Dermat. Zeit.*, 1921, **32,** 348-55).—In an exposed portion of skin (in the rabbit) the stratum corneum constitutes the most important tissue for carrying away the pigment which is formed. A part of the pigment, however, wanders into the lymph spaces and appears in the lymphatic glands. The cells of the cutis probably do not take any great share in the transport of excess pigment.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3769. Die Genese der Zungenpapillen beim Menschen. T. J. Hellman (*Upsala Läk. Fördh.*, 1921, **26,** Häft 5/6, Paper No. XI., pp. 72).—Histogenetically the tongue papillæ are different formations, and one kind does not pass into another.—W. D. H.

3770. Lois de croissance des tissus constituant le poumon fœtal du mouton. E. Fauré-Fremiet (*Compt. rend.*, 1921, **173,** 737-40).—The growth in weight of the sheep's fœtal lung can be represented by a curve which conforms to an equation of Brailsford Robertson. The curve of growth of an organ represents the algebraical sum of the weights of each of its tissues. In the lung these tissues can be reduced to connective tissue and epithelium. The epithelium curve as estimated by surface measurements does not follow Robertson's, but that of connective tissue shows the same character as the curve for the whole lung. After the 12th week the epithelium ceases to grow, and then markedly regresses, while the cellular elements undergo a sort of metamorphosis. The chemical composition of the whole lung and that of the epithelial tissue varies in a continuous manner throughout fœtal life. It may be supposed that the embryonic form of the epithelium can only persist with slight modifications as long as the variations in chemical composition do not pass certain limits; beyond this, new conditions are realised to which the adult state of the cellular epithelium corresponds.—Ha. W.

MUSCLE AND NERVE. REFLEX ACTION

3771. Die Energieumwandlungen im Muskel. V. Milchsäurebildung und mechanische Arbeit. O. Meyerhof (*Pflüger's Arch.*, 1921, **191,** 128-83).—The lactic acid fatigue maximum for frog's gastrocnemius stimulated in hydrogen or in Ringer's solution with single induction shocks is usually about 0·35%; but 0·5% can be obtained if the Ringer's solution is made alkaline (P_H 10) with Na_2CO_3, and under these conditions the total anaerobic work done is increased, although the tension (in Kg.) per cm. of muscle per mg. lactic acid (the isometric lactic coefficient, or Km) usually falls off somewhat. In such alkaline solutions about 20% of the lactic acid passes out into the solution, as against 5% under neutral conditions. Administration of $NaHCO_3$ *per os* has no effect, nor has immersion of the muscle in slightly acid Ringer solution. The fatigue maximum, in other words, is conditioned by the lactic acid content of the muscle itself. The value of Km falls as anaerobic fatigue progresses if maximal shocks are employed, but not if the stimuli are submaximal; it is much reduced by alcohol, urethane, or chloral, and to a smaller extent by K salts. It is suggested that the narcotics remove the lactic acid from the contraction site. The author uses an inertia lever similar in principle to that used by Hill, and also an angular lever in which the load progressively diminishes to zero as contraction proceeds. The work deduced from tension-length diagrams is smaller than that deduced from Hill's formula. The work coefficient (Ka) of lactic acid is obtained from the work done and lactic acid produced, and would be expected to be about 8·2 (Kg. cms. per mg.)=47% anaerobic efficiency, but is actually much less, especially at higher temperatures or if the muscle is fatigued. The oxidative efficiency is half the anaerobic, and is from 20 to 24%. This agrees with work by others on the efficiency of the heart and of the whole body, where the most

favourable conditions are present, yet efficiency does not exceed 30% (=60% anaerobic). It is unlikely that the maximal potential energy set free in a muscle on stimulation ever exceeds 75% of the whole energy change. Some experiments on guinea-pig muscles gave results which were, on the whole, comparable with those obtained on frog muscle.—C. L. E.

3772. Variation positive du courant propre du muscle gastrocnémien (contribution à l'électrophysiologie du muscle). A. Hanàk (*Arch. intern. de physiol.*, 1921, **16,** 467-91).—Le courant propre du muscle strié (m. couturier ou gastrocnémien de grenouille) peut être, par la traction, soit augmenté soif diminué. La variation positive s'observe lorsque le muscle est fatigué et que l'électrode dérivant de la surface normale du muscle est placée sur une aponévrose. Elle dépend d'une augmentation de la concentration des (H^+) ions au sein des fibres musculaires, augmentation qui produit une modification de la perméabilité de l'aponévrose au point de vue des ions: c'est l'élimination de ces ions au niveau de l'électrode qui cause la variation positive du courant propre. La variation propre du courant musculaire n'est pas déterminée par un processus d'assimilation, car le même muscle pendant la même contraction peut donner la variation négative se l'on dérive de deux points non recouverts de l'aponévrose. Les manifestations bioélectriques étant liées aux mouvements des ions, n'indiquent sans doute par la qualité des processus chimiques qui se passent au niveau des parties colloïdales de la substance vivante.—L. F.

3773. The Electric Response of Denervated Muscle. E. D. Adrian and D. R. Owen (*J. Physiol.*, 1921, **55,** 326-31).—Henriques and Lindhard stated that the electrical change in a stimulated muscle is wholly due to a change of potential in the nerve ending, and that there is no propagated electric change in the muscle fibre itself. The authors have tested this by investigating the electric response in a muscle in which the nerves had degenerated. They find no difference in the electrical response in a denervated sartorius (frog) from that of a normally innervated muscle, except that conduction is slightly more rapid in the denervated muscle.—J. H. B.

3774. Die galvanische Erregbarkeit des menschlichen Skelettmuskels nach intravenöser Zufuhr hochkonzentrierter Calciumlosungen. M. Nothmann (*Arch. exp. Path. Pharm.*, 1921, **91,** 312-6).—Injection of 25 c.c. of 10% $CaCl_2$ into patients produced marked diminution of galvanic excitability of the muscles. The anodal break shock (applied to the ulnar nerve) was most affected. The strength of current necessary for the smallest twitch had to be increased 2 to 3 times.—J. H. B.

3775. The Chemical Dynamics of Muscle. F. G. Hopkins (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 359-67).—The author's second Herter Lecture.—W. D. H.

3776. Über die Veränderung der Kraft während der Bewegung. J. H. O. Reijs (*Pflüger's Arch.*, 1921, **191,** 234-57).—Detailed account of experiments on the absolute power of muscular movements, in which the abstractor can discern no general conclusions (see Abstract No. 1694, Vol. VI., p. 245).—C. L. E.

3777. Die Beziehungen des Ruhestromes zur Erregbarkeit. H. Voelkel (*Pflüger's Arch.*, 1921, **191,** 200-10).—There is no connection at all between rest current and excitability. Narcotics always cause negativity at the site of application, irrespective of whether there is an increase or a diminution of excitability.—C. L. E.

3778. Creatinine and Creatine in Muscle Extracts—I. and II. F. S. Hammett (*J. Biol. Chem.*, 1921, **48,** 127-31, 133-41).—I. A comparison of the picric acid and tungstic acid methods of deproteinisation. Both methods give identical results. II. Extracts of the albino rat muscle, when incubated at body temperature, show an increase of creatinine varying with the P_H. This increase, which takes place at the expense of the creatine, is greatest at the neutral point. It is probable that an enzyme

aids this change, but no positive evidence of such enzyme in muscle extracts was found.—T. A. W.

3779. Proteins of the Muscle of Haliotis. E. Takahashi (*J. Chem. Soc. Japan*, 1921, **42,** 537-45).—Crushed muscles of the ear-shell, *Haliotis gigantea*, were boiled with water, the insoluble part was treated with alcohol and ether, and dried; it contained water 4·02%, ash 6·40%, and total N 14·236%; 120 gm. of the dried sample were hydrolysed, and amino-acids were isolated: Cystine 4·3, tyrosine 5·6, glutamic acid 12·4, alanine 1·2, leucine 18·0, proline 2·7, serine 2·3, aspartic acid 3·8, arginine 6·4, histidine 0·4, and lysine 3·4 gm. Glycine was not present, and the presence of phenylalanine and valine was doubtful.—W. D. H. (*J. C. Soc.*).

3780. Der Kreatingehalt des Froschmuskels im Zustande der hypnotischen Starre. H. Schönfeld (*Pflüger's Arch.*, 1921, **191,** 211-6).—After several hours of rigidity the muscles showed an average increase of creatine of 21·4%.—C. L. E.

3781. Die Lösung der Muskelstarre und die Beziehungen zwischen Quellung und Gerinnung des Muskeleiweiss. H. H. Weber (*Pflüger's Arch.*, 1921, **191,** 186-99).—The osmometer used in previous experiments (Abstract No. 1213, Vol. VI., p. 180) was modified by using a collodion membrane permeable for water and salts, while practically or totally impermeable to protein. The conclusion of the previous work that resolution of rigor is due, not to shrinkage of structural elements, but rather to bursting occasioned by accumulation of lactic acid, is confirmed.—C. L. E.

3782. Zur Kenntnis der Totenstarre. H. Winterstein (*Pflüger's Arch.*, 1921, **191,** 184-5).—Frog's sartorii kept in gaseous N_2 or H_2 show rigor in the usual way; if kept in O_2 free Ringer's solution no rigor develops, and lactic acid can be detected in the solution. This is further proof that it is the accumulation of lactic acid which causes rigor.—C. L. E.

3783. The Isometric Twitch. W. Hartree and A. V. Hill (*J. Physiol.*, 1921, **55,** 389-411).—A prolonged contraction cannot be the resultant of *similar* units occurring in succession. The response to a later stimulus is different from that to an earlier one. The effect of temperature changes on the isometric twitch is described; tension/heat (T/H) is independent of temperature. The isometric curve occasionally shows a "hump." Extension of the muscle (frog's sartorius) slows the relaxation and so prolongs the twitch. As the strength of a shock increases, heat production increases in steps to a maximum, then tends to fall off to not more than 15% of the maximum. The tension rises in steps to a maximum, and then remains constant; H/T rises to a maximum and then falls, and the curve of response changes in shape. Here, then, the "all or none" law fails within limits. If 2 maximal shocks are sent in in succession, the thermal or mechanical response of the muscle to the second can be determined. Under all conditions there is a phase of supernormal mechanical response, usually accompanied by supernormal heat production. This phase is the true "staircase effect." It lasts longer than the phase of supernormal excitability in nerve, but is shorter than that in heart muscle. The efficiency of the contraction (T/H) is increased as a result of a previous shock at a suitable interval. Curare increases and maintains the contractile power of a muscle placed on a thermopile insulated with shellac.—W. D. H.

3784. Isochronisme du nerf et du muscle et excitation unipolaire. G. Banu, R. Dériaud, and H. Laugier (*Compt. rend. soc. biol.*, 1921, **85,** 841-4).—In the usual determination of muscle or nerve chronaxie, when two electrodes are placed either on the muscle or on the nerve, it is normally found that the chronaxie is identical for the two tissues. If, however, one electrode is placed in the mouth (of a frog) and the other on the nerve or muscle, the chronaxie of the nerve is conspicuously less than that of the muscle. This difference is explained as being a particular example of the fact that the chronaxie diminishes with the distance between the electrodes.—J. H. B.

3785. Osservazioni sopra la legge di Sherrington della innervazione reciproca dei muscoli antagonisti. P. Dorello (*Polyclinico sez. prat.*, 1921, **18,** 611-6).—Reciprocal innervation is shown, not only by the muscles of the limbs, but also by those of the trunk. This fact can be used for obtaining complete relaxation of a muscle, which renders difficult the palpation of an internal organ. Investigation of the abdominal organs is facilitated by making the patient support himself in a horizontal position on shoulders and feet with the ventral side uppermost and the back raised a short distance above the floor.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3786. Heat-Block of Sensory Fibres in the Sciatic Nerve. Elvira O. Ostlund, P. C. Hodges, and P. M. Dawson (*Amer. J. Physiol.*, 1921, **57,** 470-7).—The sensory fibres lose their power of conduction before the motor fibres (see Abstract No. 1219, Vol. VI., p. 181).—W. M. B.

3787. Die Regeneration im Nervensystem. E. Hedinger (*Schweiz. Arch. f. Neurol. u. Psychiat.*, 1921, **9,** 3-28).—A useful review of the work of previous writers' views. The author does not support strongly any particular theory, but urges that in such questions the physiologist and morphologist must co-operate.—W. D. H.

3788. Étude sur les relations entre l'ion K et l'excitation du nerf pneumogastrique. J. Bouckaert (*Arch. intern. de physiol.*, 1921, **16,** 453-60).—L'effet inhibiteur de la pilocarpine sur le cœur de grenouille est dû a une excitation des "*myo-neural junctions*" du pneumogastrique. La suppression du potassium dans le liquide de Ringer qui alimente le cœur diminue fortement cette action de la pilocarpine. Un cœur de grenouille arrêté par du Ringer absolument privé de K peut reprendre une série de contractions sous l'effet d'une dose de pilocarpine. Mais ce résultat n'est pas constant. L'excitation du pneumogastrique alors que le cœur est arrêté par manque de potassium dans le Ringer, produit une ou plusieurs séries de contractions. Ces expériences confirment les vues de Howell en vertu desquelles les nerfs du cœur agissent au moyen de changements dans les quantités d'ions K et Ca dans le liquide circulant. Le pneumogastrique agirait par libération d'ions K.—L. F.

3789. Sur le centre de la faim. I. P. Pavlov (*J. de psychol.*, 1921, **18,** 273-81).—An account of the properties and functions of the "hunger centre." A conditioned reflex can be established in a dog such that the secretion of saliva in response to a light stimulus is delayed by about 3 minutes. This period of delay can be brought to an end by any unusual stimulus, and it is not observed during the period before a customary feeding time, owing to the increasing sensitiveness of the hunger centre and its more powerful control over the salivary centre. Normally the hunger centre is in a condition of inhibition, but this condition can be removed by the placing of acid in the mouth. Hence the value of acid foods in stimulating appetite. The taking of food leads to stimulation of the hunger centre, but filling of the stomach leads again to inhibition. If the cerebral hemispheres are removed the hunger centre is less easily inhibited; a decerebrate dog remains restless and secretes saliva for an hour after having been given a little food, while a normal dog would be at rest.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3790. Gefässreflexe. U. Ebbecke (*Die Naturwissenschaften*, 1921, **9,** 439-45).—An interesting review on vascular reflexes, and their reversal under certain conditions. —C. L. E.

3791. Ricerche cronografiche sui movimenti bilaterali di reazione. Y. Terashi (*Arch. di Fisiol.*, 1912, **19,** 183-96).—When bilateral reaction movements are caused by means of tactile stimuli so slight as to avoid reflexes, the movements of the right hand precede those of the left. The average difference is of 7 to 12 σ. This difference is maximal if the stimulus acts on the right side, minimal on the opposite side. These results have a constant character, and agree with those formerly obtained by Herlitzka. They are explained by assuming the existence of one gnostic motor centre in the left hemisphere.—C. d. F.

CENTRAL NERVOUS SYSTEM

3792. Functional Regulations in Animals with Composite Spinal Cords. S. R. Detwiler (*Proc. Nat. Acad. Sci.* [U.S.A.], 1920, **6,** 695-700).—In amblystoma, that portion of the spinal cord which normally gives off fibres to the fore limb was extirpated and replaced by a portion from lower segments. In 50% of the cases normally acting fore limbs were developed, and a brachial plexus of normal size was found. The stimulus to this hyperplasia of the spinal segments arises in the higher centres.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3793. Sensory Disturbances from Lesions in Medulla Oblongata and Pons. G. Bergmark (*Upsala Läk. Fördh.*, 1921, **26,** Häft 5/6, Paper No. V., pp. 109).—A lengthy description of clinical cases; from this "sparse material" the author concludes provisionally that the muscular sense has two paths, which can replace each other: one is posterior column of cord, internal arcuate fibres and fillet (lemniscus); the other is Flechsig's tract to cerebellum, where it crosses over to the brain stem by one of the large cerebellar commissures. Under ordinary conditions the first is mainly used. —W. D. H.

3794. Zur Diskussion über das zerebellare Lokalisationproblem. C. Hesser and A. Troell (*Upsala Läk. Fördh.*, 1921, **26,** Häft 5/6, Paper No. XII., pp. 20).—Clinical cases; the function of the cerebellum is discussed, but evidence of strict localisation in the cerebellar cortex is lacking.—W. D. H.

3795. La question des localisations cérébrales. J. Demoor (*Bull. soc. sc. méd. nat. Bruxelles*, 1921, 107-14).—Discution critique de nos connaissances sur les fonctions gnosiques et praxiques ainsi que sur le problème de la dissymétrie fonctionnelle des hémispheres cérébraux. L'idéation résulte d'une association d'idées orientée conformément à la loi du moindre effort. On doit considérer les images mentales comme non réelles. Il ne faut probablement pas vouloir localiser une série d'activités qui sont l'expression fugace et temporaire d'un dynamisme régi par des nécessités fonctionnelles et non par des structures.—E. Z.

3796. The Nucleus in the Human Restiform Body. K. Hirose (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 336-8).—This is on the dorso-medial aspect; its more exact position is described at length. It is probably a portion of the inferior olive.—W. D. H.

3797. The Growth of the Central Nervous System in the Human Fœtus. H. L. Dunn (*J. Comp. Neurol.*, 1921, **33,** No. 5).—The growth is similar to the growth in body weight at this time. It shows three distinct subtypes of growth: (1) Cerebral growth, which is slow and steady prior to the sixth fœtal month, and is more rapid from that time to birth; (2) brain stem and cord growth, which is more rapid from the second to the last of the fifth fœtal month than it is thereafter; and (3) cerebellum growth, which is very slow from the second to the last of the sixth fœtal month, and extremely rapid in the last 4 months of intra-uterine life.—W. D. H. (*W. I.*).

3798. Cholesterol and Fatty Acid Content of the Brain. T. Magayania (*Tokio Igakwai Zasshi*, **22,** No. 8; *Sei I Kwai Med. J.*, 1918, **37,** No. 9; *Jap. Med. Lit.*, 1921, **6,** 20).—Dried powdered *ox brain* contained 10·4% cholesterol. The substances soluble in warm petroleum ether amounted to 44·4%, and were equally divided between fatty acids and unsaponifiable matter.—W. D. H. (*Chem. Abstr.*).

3799. Di alcuni fatti biochimici del preparato centrale di bufo. E. Sereni (*Arch. di Fisiol.*, 1921, **19,** 163-82).—By utilising the oxygen of H_2O_2 the cerebro-spinal preparation of *B. vulgaris* generally survives about 20 hours at a temperature of 15° to 20° C. The quantity necessary for every preparation is about 3 c.c. of a 0·9% solution. The fluid always contains CO_2 and amino-acids; the quantity of these in living pre-

parations is about double that found in dead ones. After boiling the fluid has a strongly alkaline reaction, though still containing amino-acids. Strychnine employed at the beginning of the experiment has a beneficial influence on the survival of the preparation; used in the last hours it prolongs life of the preparation without causing tetanic symptoms. The death of the cerebro-spinal preparation is probably due to the accumulation within the nerve cells of amino-acids.—C. d. F.

SPECIAL SENSE ORGANS

3800. Die Wasserstoffzahl des Kammerwassers bei Föten. J. W. Nordenson (*Upsala Läk. Fördh.*, 1921, **26,** Häft 5/6, Paper No. XXV., pp. 5).—Observations on the H-ion concentration in the aqueous humor of fœtal calves show no appreciable variations with age, etc., though on the whole it is rather higher than it is after birth.—W. D. H.

3801. Remote Results of Complete Homotransplantation of the Cornea. A. H. Ebeling and Anne Carrel (*J. Exp. Med.*, 1921, **34,** 435-40).—Transplantation of a corneal flap from one cat to another was successful. The curvature and transparency were normal 2 years later.—C. L. E.

3802. Das Sehen. F. Schanz (*Münch. med. Woch.*, 1921, **68,** 1390-2).—A paper containing much interesting speculation. Apparently the lens of the eye is fluorescent. This fact means that the eye can transform illumination of higher energy into illumination of lower energy. Unless energy is lost, changes must take place in the eye. These changes manifest themselves in the course of life in the slow transformation of lens protein from an easily soluble to a relatively insoluble form. All protein is affected by light in this way, though unless special receptors are present it is only light of short wave length which can so act. If light falls on a metal plate, electrons are thrown off. Light rays fall on the pigment of the retina, electrons are thrown off, and these electrons are collected by antennæ, which are the rods and cones, etc. The author then endeavours to explain how albinos see.—J. H. B.

3803. Über die Beobachtung und Abbildung dünner Fäden. W. Einthoven (*Pflüger's Arch.*, 1921, **191,** 60-98).—Threads 0·1 μ thick can be seen by the naked eye as lighter lines on a dark background, and all practicable threads, however thin, can be made visible by the ultramicroscope. The diameter of the finest thread that could possibly be rendered visible would be $0{\cdot}2\times10^{-6}\,\mu\mu$, which is about 10^6 times smaller than that of a hydrogen molecule. Visibility to the naked eye of dark threads against a light background depends, not on the distance apart of the cones of the retina, but on discrimination of differences of brightness; whereas 2 points of light are just separately visible when their images on the retina have a visual angle of 60″, a thread can still be seen at an angle of 2″. In microscopic examination, conditions which hinder definition increase the apparent diameter of fibres. In microscopic observation, the distance between 2 points just separately visible is $l \geq \frac{\lambda}{2\,N}$, where, if N, the numerical aperture, =0·95, and λ, the wave length, =0·6 μ, l, the distance apart, =0·31 μ. But a thread of 0·2 μ diameter is seen so clearly that irregularities can readily be made out; if N, however, is 0·18, the image, though still visible, is much less sharp. With good arrangements fibres of 0·03 to 0·04 μ yield reasonably good images.—C. L. E.

3804. Photo-Electric Theory of Vision. J. H. J. Poole (*Phil. Mag.*, 1921, **41,** 347-52).—Rhodopsin does not act as a sensitiser to the photographic plate. If electrons are liberated they cannot be detected; none were found when light was allowed to act on the black pigment of the eye, or on the frog's retina. No support is afforded to Joly's theory (Abstract No. 2511, Vol. VI., p. 362).—W. D. H.

3805. Sur les variations de la sensibilité autour de la tache de Mariotte. G. Michailesco (*Compt. rend.*, 1921, **173,** 604-6).—Former observers assign to the blind spot an angular dimension of at least 5° 30′ to 6°. The experimenter with ordinary lighting obtains the classic results; absolute blindness, however, extends only for 4° 40′, but there is a zone of imperfect perception of about 1° 30′ all round the spot. This zone has been studied, using as source of light a limited region of the diffuser of the photoptometer of Charpentier. The horizontal diameter of the blind spot has then been found to be nearly twice as great as by ordinary lighting. In the cat, as the light is progressively increased from an intensity twice as great as the minimum perceptible to 20 times as great, the diameter decreases from 7° to 4° 30′. With greater degrees of illumination the size of the spot is further diminished. With a light of moderate intensity complete blindness is not obtained, but a luminous haze, which shows a fan-like striation. The phenomena are the same through red or blue filters.—Ha. W.

3806. The Blind Spot. III. The Relation of the Blind Spot to Medullated Nerve Fibres in the Retina. H. S. Gradle (*J. Amer. Med. Assoc.*, 1921, **77,** 1483-6).—Medullated nerve fibres in the retina adjacent to the disc as a rule enlarge the blind spot; the enlargement seldom corresponds to the ophthalmoscopic picture of the medullated area. This disparity indicates that medullated fibres within the retina are not opaque to incident illumination for the entire length of the medullation; the enlargement thus indicates merely the amount of retinal area that is prevented from being functional by the presence of overlying medullated nerve fibres in a layer sufficiently thick to occlude incidental light. The term "opaque nerve fibres" should be replaced by the proper term "medullated nerve fibres."—C. L. E.

3807. Resonance Hypothesis of Audition. H. Hartridge (*Brit. J. Psychol.*, 1921, **12,** 142-6).—Further evidence in favour of Helmholtz and against Wrightson and Perrett is adduced (compare Abstracts No. 1238, 1724, Vol. VI., pp. 184, 250). The main new point is this: If a body of men cross a suspension bridge they set it swinging at a corresponding rate; if they change step, the bridge's motion is first arrested, and then will restart in time with the new step. The resonating apparatus in the ear does exactly the same with each new note.—W. D. H.

3808. La rôle des otolithes dans les mouvements spontanés des animaux pendant le saut et la chute. F. H. Quix (*Compt. rend.*, 1921, **173,** 864-5).—The author starts from the hypothesis that each otolith acts by its weight on the hair cells of the macula. The stimulus is at a maximum when the pressure is greatest. The otolithic apparatus acts in 2 planes: the vertical median for rotation round the bitemporal axis, and the frontal plane for rotation round the orocaudal axis. The otoliths of the utricle of each side act in the median vertical plane; their pressure effects flexion of the limbs, neck, and trunk, and causes the eyes to turn up. The disappearance of the weight causes marked extension of the limbs and lowering of the eyes. The otoliths of the saccule act in the frontal plane in an antagonistic sense, and cause the body and eyes to turn in the frontal plane. During the jump, as the body rises the increase in weight of the utricular otoliths causes marked flexion effects, and the animal is easily able to clear an obstacle. When the animal descends the weight of the otoliths disappears, and this causes marked extension of the limbs and body, and the eyes turn down. These reflexes are clearly shown in instantaneous photographs of jumping horses. The change in weight of the otoliths of the saccule during the jump and fall produce no effect, as those of the two sides are mutually antagonistic.—Ha. W.

3809. Zur Biologie der Schildkröten (Beiträge zur Physiologie des Geruchs- und Geschmackssinns). H. Honigmann (*Biol. Zentralb.*, 1921, **41,** 241-50).—A study of the relative importance of the senses of sight, smell, and taste in the lives of various species of turtle.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

PSYCHOLOGY

3810. Nos sensations et le monde extérieur. Léon Fredericq (*Arch. intern. de physiol.*, 1921, **17,** 110-12).—Conformément au principe de l'énergie spécifique des organes des sens, nos sensations ne présentent aucun rapport de *qualité* avec les agents extérieurs qui les ont provoquées. Il est cependant deux attributs de nos sensations qui dépendent directement de particularités de l'agent d'excitation. Ce sont la *durée* et *l'intensité* de la sensation, qui varient avec la *durée* et *l'intensité* de l'excitation.—L. F.

3811. Une illusion optique dans l'appréciation de la vitesse. C. Richet (*Compt. rend.*, 1921, **173,** 805-6).—We appreciate our rapidity of movement by the rapidity with which objects we pass seem to move. But this judgment is only relatively correct. This is seen best on board ship. Suppose the vessel moves with rapidity V, and one paces the deck at a rapidity v, and we pace the deck in the direction of the ship's journey, the real rapidity of forward movement is $V+v$; in the opposite direction it is $V-v$, but the ship appears to move faster in the latter case.—W. D. H.

3812. Sur les troubles produits chez le chien par les oscillations rhythmiques. E. Pozerski (*Compt. rend. soc. biol.*, 1921, **85,** 769-70).—Seven out of 10 dogs placed on a revolving table for 5 hours displayed no symptoms; 2 became agitated, and the remaining 1 suffered from weakness. The 2 "agitated" dogs suffered from a violent polypnœa, nausea and vomiting. These symptoms are absent if the dog is fasting when the experiment is carried out. After 3 or 4 experiments on sensitive dogs no further symptoms were seen. They became accustomed.—J. H. B.

3813. Effects simulating Fatigue in Simple Reactions. F. L. Wells, C. M. Kelley, and G. Murphy (*J. Exp. Psychol.* [*Amer.*], 1921, **4,** 137-42).—The simple reaction process is generally regarded as resistant to fatigue (Cattell), and capable of improvement with practice. The authors find in some long-continued experiments a decrease in efficiency, but hesitate to call it fatigue, and a casuistical discussion follows what that word means. They, however, find no evidence of the formation of fatigue toxins and the like. They hint that the concept fatigue may die barren and perish. They also consider what is meant by monotony: is disagreeableness a result of sameness, or is it due to increasing difficulty resulting from sameness? We may leave the answer to future psychologists.—W. D. H.

3814. The Pursuitmeter. W. R. Miles (*J. Exp. Psychol.* [*Amer.*], 1921, **4,** 77-105).—For detecting the influence of superimposed nutritional factors, fatigue, and the like, it is urged that not only the reactions, but the eye-hand co-ordinations that naturally follow reactions should be measured. An apparatus called a pursuitmeter is described in detail. It is an arrangement of common electrical instruments which tests the subject's ability to balance two electrical circuits. The task is continuous, and requires constant attention calling for both quickness and accuracy. The amplitude and duration of all errors are integrated electrically and accumulated by two meters which may be read directly during or at the end of the test. The measurement of children and adults may be directly compared. It is shown that practice results in quite regular improvement, and that the apparatus provides a very convenient and at the same time sensitive indicator for neuro-muscular efficiency.—W. D. H.

3815. Psychic Galvanic Reflex Phenomenon in Ear Examination. C. J. A. van Iterson (*Acta oto-laryng.*, 1920, **2,** 174-87).—Recommends the application of the psychogalvanic reflex to the detection of cases of simulated deafness.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

CEREBRO-SPINAL FLUID

3816. Le liquide céphalorachidien. L. Stern. **Der Kreislauf des Liquor cerebrospinalis.** C. v. Monakow (*Schweiz. Arch. f. Neurol. u. Psychiat.*, 1921, **8,** 215-32, 233-4).—The first paper is an address dealing at length with the different views of the origin, uses, and fate of cerebro-spinal fluid. The choroid gland is regarded, not so much as a true gland, but the situation where a transudation is deprived of all substances likely to be harmful to nerve cells (a glandular protective membrane). The fluid, after passing into the cerebro-spinal cavity, bathes the nerve elements, then passes into the subarachnoid space and thence to the blood. This view is shared by Monakow, who in the second paper briefly describes it, and reproduces an old but useful diagram of his to indicate the course the fluid takes.—W. D. H.

3817. Sur le liquide céphalo-rachidien. I. Les rapports entre le liquide céphalo-rachidien et la circulation sanguine. L. Stern et R. Gautier (*Arch. intern. de physiol.*, 1921, **17,** 138-92).—Les substances étrangères introduites dans la circulation générale ne peuvent pas toutes être décelées dans le liquide céphalo-rachidien. Il y a sous ce rapport de grandes différences pour des substances de constitution chimique et physique voisine. Vis-à-vis de certaines substances, il y a des différences d'une espèce animale à l'autre et même d'un individu à l'autre. Le passage ainsi que la non pénétration de certains corps du sang vers le liquide céphalo-rachidien est réglé par un mécanisme spécial que les auteurs appellent *barrière hémato-encéphalique.* Mais le triage opéré par la barrière en question vis-à-vis des substances circulant dans le sang ne s'effectue pas vis-à-vis des substances se trouvant dans le liquide céphalo-rachidien. Toutes les substances introduites dans le liquide céphalo-rachidien passent indistinctement dans le sang.—L. F.

3818. Sugar of Cerebro-Spinal Fluid. R. Coope (*Quart. J. Med.*, 1921, **15,** 1-8).—A low sugar content is found in tubercular meningitis, and certainly not a high one in encephalitis lethargica, which some French writers claim.—W. D. H.

3819. Viscosity of Cerebro-Spinal Fluid. T. Soda (*J. Nervous and Ment. Dis.*, 1921, **54,** 227-35).—If the protein increases the viscosity rises.—W. D. H.

3820. Note sur la coagulation du liquide encéphalo-rachidien dans trois cas de compression médullaire. P. Govaerts (*Compt. rend. soc. belge biol.*, 1921, 748-50).—Les liquides étudiés, très albumineux, mais pauvres en cellules, ne coagulaient pas spontanément. Par contre, ils se prenaient en masse par addition de sérum frais. Cette absence de coagulation spontanée ne paraît pas due à l'existence d'une antithrombine. Elle semble résulter du manque de cytozyme, car l'addition de cet élément détermine la coagulation. Ces caractères sont identiques à ceux que l'on observe dans certains exsudats des séreuses et des articulations.—E. Z.

3821. Rapid Estimation of Albumin in the Cerebro-Spinal Fluid. P. Ravaut and L. Boyer (*Presse méd.*, 1920, 42; *J. pharm. chim.*, 1921 [7], **23,** 281-4).—A nephelometric method is described, in which the turbidity produced by the addition of sulphosalicylic acid is compared with that produced by the addition of definite amounts of $AgNO_3$ to definite amounts of NaCl.—W. D. H. (*Chem. Abstr.*).

BLOOD

3822. Über die Senkungsgeschwindigkeit der Blutkörperchen bei Säuglingen. Gertrud Nadolny (*Berlin. klin. Woch.*, 1921, **58,** 998-9).—The sedimentation at birth is rapid as compared with that in the adult; this difference disappears when the children

reach the age of 2 months. Fever hastens sedimentation. The clinical value of this mode of investigation is regarded as doubtful.—W. D. H.

3823. Die Messung von roten Blutkörperchen mittels der dadurch erzeugten Beugungserscheinungen. F. L. Bergansius (*Pflüger's Arch.*, 1921, **192,** 118-29).—See Abstract No. 3363, Vol. VI., p. 494.—C. L. E.

3824. Über die Permeabilität der roten Blutkörperchen. E. Wiechmann (*Deutsch. med. Woch.*, 1921, **47,** 824-5).—The rapidity with which the exchange of ions occurs depends on specific properties of the ions themselves. The author confesses he cannot completely explain many details in his own work and in that of others (Siebeck, Hanburger, etc.).—W. D. H.

3825. Contributions à l'étude du sang de Cobitis fossilis. I. Cristaux du sang. H. Lupu (*Ann. scient. de l'univ. de Jassy*, 1921, **11,** 105-12),—The hæmoglobin of the blood of this fish, like that of the rat and guinea-pig, crystallises out without difficulty. No hæmolytic agent is required. The crystals are large and numerous, and afford a good opportunity for chemical and optical study. Crystals of the derivatives of hæmoglobin are just as easily obtained. The causes of the richness of *Cobitis fossilis* in oxyhæmoglobin are being further investigated.—D. H. de S.

3826. The Identity of Hæmoglobin in Human Beings. G. S. Adair, J. Barcroft, and A. V. Bock (*J. Physiol.*, 1921, **55,** 332-8).—Hæmoglobin solutions from different individuals give identical oxygen dissociation curves; this does not apply to blood partially laked by dialysis.—C. L. E.

3827. Variations brusques de la formule leucocytaire sous l'influence d'actions nerveuses immédiates. J. Tinel and D. Santenoise (*Compt. rend. soc. biol.*, 1921, **85,** 715-6).—In patients compression of the eyeball for 1 minute, resulting in a diminution of pulse-rate from (say) 84 to 64, produces also a diminution in the polymorphonuclear leucocytes (determined in a drop of blood from the finger) from 4,300 to 1,600; 2 minutes later the figure has risen to 3,300. Similarly freezing a finger by a jet of ethyl chloride can cause a fall of 2,000 to 4,000 in the leucocyte count. Vaso-dilatation produced either locally by warm air or generally by amyl nitrite causes a rise in the leucocytes (*e.g.*, 3,000). The leucopenia following ocular compression is not produced in denervated areas. Consequently variations in the number of leucocytes may occur as a result of nervous influences.—J. H. B.

3828. A propos des variations brusques de la formule leucocytaire sous l'influence d'actions nerveuses immédiates. P. Pagniez (*Compt. rend. soc. biol.*, 1921, **85,** 766).—If the vagus or the depressor is excited in the dog or the rabbit a temporary leucopenia is produced. A similar leucopenia follows ocular compression. The author does not regard the changes in the blood-picture as due to vaso-motor conditions, although the changes occur simultaneously with the fall of blood-pressure; the decrease in leucocytes occurs in arterial as well as in venous blood. He suggests a nervous mechanism "not purely vaso-motor."—J. H. B.

3829. Research on the Blood. E. Liebreich (*Schweiz. med. Woch.*, 1921, **51,** 275).—All factors which prevent coagulation prevent the appearance of eosinophile cells and of Charcot's crystals in the blood. It is possible to cause large masses of eosinophile cells and Charcot crystals to appear in every specimen of extravasated blood, regardless of the previous proportions of eosinophiles. Eosinophile granules are the crystals of a substance which, when conditions are favourable, crystallises as Charcot's crystals. Eosinophilia is the result of an overproduction of this eosinophile secretion and of its solvent, both of which participate in coagulation outside of the body. Eosinophilia may be the expression of some phenomenon of colloidoclasis as Widal uses the term. Charcot's crystals can be shown in any blood by removing the plasma and allowing the drop of blood to coagulate between slides. Among the facts which these assump-

tions explain is the sudden appearance of eosinophilia, as may occur in asthma; also the local and general eosinophilia which may accompany considerable extravasation of blood that does not coagulate; also the abundance of eosinophiles and Charcot's crystals in myelogenous leucæmia with its slow coagulation of blood.—W. D. H. (*Chem. Abstr.*).

3830. Fonction antixénique des globulins (plaquettes). J. Roskam (*Compt. rend. soc. belge biol.*, 1921, 733-5).—Le chauffage à des températures de plus en plus élevées diminue, puis abolit le pouvoir agglutinant du plasma d'une part (précipitation et altération de certaines de ses protéines), des plaquettes isolées et lavées d'autre par vis-à-vis des particules d'encre de chine; des lavages répétés au moyen de solution physiologique diminuent progressivement le pouvoir agglutinant des plaquettes isolées vis-à-vis des mêmes particules. Ces faits rendent très probables la nature plasmatique de la fonction antixénique de l'organisme, les plaquettes participant à cette fonction par la couche de plasma adhérente à leur surface.—E. Z.

3831. Effets de l'injection des plaquettes lavées sur l'élimination des microbes circulants dans le sang. P. Govaerts (*Compt. rend. soc. belge biol.*, 1921, 745-7).—Une demi-heure après l'injection de bacilles typhiques dans les veines du cobaye, le nombre de microbes qui subsistent dans la circulation diminue d'une manière continue mais assez lente. Si à ce moment on injecte des plaquettes lavées dans les veines, on détermine une diminution très notable du nombre des germes circulants. Cet effet ne se produit pas lorsqu'on introduit dans les veines, au lieu des plaquettes, une suspension de globules rouges lavés.—E. Z.

3832. Influence de faibles doses de peptone sur l'élimination des microbes injectés dans le sang circulant. E. Delcourt-Bernard (*Compt. rend. soc. belge de biol.*, 1921, 238-40).—La peptone à faible dose diminue les propriétés d'affinité des plaquettes entre elles. Si les plaquettes sanguines participent au mécanisme de l'élimination des microbes, cette élimination est indépendante du volume des amas de plaquettes. Les deux phénomènes: formation des amas de plaquettes et accolement des microbes aux amas formés, ne sont pas nécessairement parallèles; la peptone, à faible dose, favorise la phagocytose du staphylocoque dans le sang du lapin et du cobaye.—E. Z.

3833. Recherches sur le principe antigénique du globule rouge. F. Chodat (*Compt. rend. soc. belge biol.*, 1921, 735-8).—Ce sont bien les stromas eux-mêmes, et non les globulines que l'on peut extraire des globules rouges par l'action de l'eau distillée et du gaz carbonique, qui possèdent le pouvoir de fonctionner comme antigène et d'entrer en réaction avec les principes actifs des sérums hémolytiques.—E. Z.

3834. Das Verhalten von Thrombocyten und Leukocyten im strömenden Blut und den innern Organen nach intravenöser Zufuhr von Witte-Pepton. S. Seeliger and H. Gorke (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 322-40).—After peptone injections (0·2 to 0·3 per kilo), a sudden leucopenia ($\frac{1}{10}$ of the normal) occurs, which is followed by leucocytosis after the cessation of the toxic effect. By repeated injections increase of eosinophile cells was observed. Thrombopenia also occurs a short time after the injections. Intravenous adrenaline injections have a favourable influence on the changes of the blood. Peptone causes atony of the veins, venous hyperæmia, and diminution of the blood-pressure. The consequence of this stagnation is an increased development of the thrombocytes. Peptone has direct poisoning effects on the leucocytes.—H. W.

3835. Fibrin Content of Human Blood. H. C. Gram (Copenhagen: Steen Hasselbalch's Forlag, 1921, pp. 276 [Danish]).—A method of estimating fibrin in 2 c.c. of citrated blood after adding $CaCl_2$ is described. In normal adults the plasma yields 0·2 to 0·38%; in whole blood the figures are 0·11 to 0·19. In many diseases the same holds. In some cases of pernicious anæmia and in liver degeneration it is less. The origin of fibrinogen in the liver thus finds support. The hæmorrhagic diathesis is not

caused by fibrin deficiency. In pneumonia, suppuration, nephritis, cancer, uncompensated heart disease, and in pregnancy the percentage rises; this may be related to irritation of the liver.—W. D. H. (*Med. Sci.*).

3836. Rôle of Tissue Fibrinogen on Fibrin Formation. C. A. Mills and G. M. Guest (*Amer. J. Physiol.*, 1921, **57,** 395-419).—Wooldridge's tissue fibrinogen is regarded as the same thing as thrombokinase. The fibrin yield of plasma varies greatly by tissue extract addition; it may rise to over 150% of the normal. The globulin fraction of the extract (but not the other proteins) act in the same way. Removal of the phosphatide by benzene lessens or destroys this power, the effect depending on the completeness of the removal. The fibrin formed by tissue fibrinogen is poor in nitrogen; phosphorus estimations show that the phosphatide is present in the final product, and Ca is regarded as the connecting link. Tissue fibrinogen (thromboplastin, Howell) acts as a kinase, and not by removing antithrombin, but if antithrombin is present tissue fibrinogen neutralises its activity.—W. D. H.

3837. L'action coagulante du chloroforme sur le plasma d'oiseau. P. Nolf (*Arch. intern. de physiol.*, 1921, **16,** 374-447).—Malgré son extrême stabilité, le plasma d'oiseau contient tous les éléments de la fibrine et de la thrombine. S'il ne se coagule pas spontanément, ce n'est pas parce que l'un ou l'autre constituant essentiel de la coagulation lui fait défaut, mais simplement parce que les rapports de quantité entre les tendances qui favorisent et celles qui empêchent la coagulation sont en faveur des dernières. Le chloroforme ne détruit pas un principe coagulant pas plus qu'il ne produit l'autolyse en s'emparant d'un principe antilytique. Il favorise directement la coagulation dans une mesure extrême, ce qui a pour conséquence la production de très grandes quantités de thrombine. La formation de la fibrine et de la thrombine est accompagnée dans la même mesure d'une disparition d'antithrombosine et d'antithrombolysine. Ceci permet d'affirmer que ces substances ne subissent par l'action directe du chloroforme; leur sort est lié à celui de la thrombine. Tout se passe comme si le chloroforme exaltait l'activité réactionnelle du facteur essentiel de la coagulation que Nolf a appelé thrombozyme. Sous l'influence du chloroforme, la thrombozyme s'empare des colloïdes d'origine hépatique du plasma (antithrombosine, antithrombolysine, fibrinogène). Elle en fait d'abord de la fibrine et de la thrombine; mais elle les digère ensuite: au processus de coagulation fait suite une protéolyse intense pendant laquelle la fibrine se redissont, tandis que la thrombine disparaît progressivement.—L. F.

3838. Blood Coagulation. J. Bordet (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 213-8).—Herter Lecture. Discussion of theories (see Abstracts Nos. 1119-20, Vol. V., pp. 178-9).—W. D. H.

3839. Zur Blutgerinnungsbeschleunigung mittels Röntgen-strahlen. R. Feissly (*Münch. med. Woch.*, 1921, **68,** 1418).—If citrated blood be illuminated with X rays, its rate of clotting on addition of $CaCl_2$ is quickened.—J. H. B.

3840. Über Blutgerinnung. III. Beitrag zum Hämophilieproblem. E. Wöhlisch (*Münch. med. Woch.*, 1921, **68,** 1382-4).—Three cases of hæmophilia gave the following results: The fibrin content of the blood and the osmotic resistance of the red cells are normal, the rate of clotting is greatly diminished, the power of accelerating clotting of hæmophilic serum is normal, the power of accelerating clotting of the individual blood-cells is normal—that is to say, the thrombokinase is normal.—J. H. B.

3841. Über den Wasserhaushalt—II. R. Meyer-Bisch (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 381-90).—After intravenous injections of small quantities of NaCl and sugar (0·3 to 1 gm.) the protein content of the lymph in the thoracic duct of dogs increases temporarily and then decreases considerably, and this lasts a long time. The outflow of the lymph decreases. A retention of water and protein in the tissues is therefore

caused by these small quantities of NaCl and sugar; larger quantities of these substances produce the opposite effects.—H. W.

3842. Über die Blutkonzentration. I. Intravenöse Salzwassereinläufe mit und ohne Gummi- (Gelatin-) Zusatz. W. Nonnenbruch (*Arch. exp. Path. Pharm.*, 1921, **91,** 218-45).—An investigation of the result of injecting gum-saline into rabbits. No appreciable diminution in the red cell count took place, even in animals from which the kidneys were previously removed. Only with a very high percentage (20%) of gum was there a plethora. The author considers that no advantage is gained by the addition of gum to Ringer's solution.—J. H. B.

3843. The Action of Carbon Dioxide on Salt and Water Distribution in Blood. G. Mukai (*J. Physiol.*, 1921, **55,** 356-70).—On treatment with CO_2 the Cl and water content of the corpuscles increase, the former by anion interchange, the latter by osmosis consequent on the increased CO_2 and Cl in the corpuscles. Corpuscles always contain more CO_2 than the corresponding serum; the CO_2 is carried partly by increased alkali and partly by proteins. There is presumptive evidence that the corpuscles were alive for more than 6 hours in these experiments.—C. L. E.

3844. The Non-Protein Nitrogen of the Blood in Chronic Nephritis with Hypertension. J. L. Williams (*Arch. Int. Med.*, 1921, **84,** 426-33).—There is a marked increase in non-protein nitrogen in this condition.—J. H. B.

3845. Über regelmassige Veränderungen der Lipoidmenge des Blutes nach Injektionen körperfremder Stoffe bei der sogenannten Reiztherapie. E. Gabbe (*Münch. med. Woch.*, 1921, **68,** 1377-9).—Injections of milk, hypertonic saline, cane sugar, horse serum, etc., cause changes in the lipoid content of the blood—*i.e.*, in the cholesterol and phosphatides. While small doses which do not affect body temperature cause an increase in the lipoids for some hours, larger doses leading to shivering and pyrexia produce a preliminary diminution followed by an increase in lipoid content. It is considered that these lipoid changes may have a relation to the onset of fever. —J. H. B.

3846. Potassium in Normal and Pathological Human Bloods. V. C. Myers and J. J. Short (*J. Biol. Chem.*, 1921, **48,** 83-9).—The K of normal human blood-serum is rather less than 20 mg. per 110 c.c., while for the whole blood the figures are 8 to 10 times this amount. The K content is roughly proportional to the total solid and red cell content. The K content was not increased in the blood of 7 nephritics with marked nitrogen retention.—T. A. W.

3847. Zur Bestimmung des Kalkgehaltes im Blut. R. Weiss (*Deutsch. med. Woch.*, 1921, **47,** 1298).—A small measured quantity of serum is placed in a specially graduated tube, ammonium oxalate is added, and the precipitate washed on the centrifuge with water. It is dissolved in H_2SO_4 and titrated with permanganate. The figures given are: Normal 12, in tetany as low as 4, in rickets as high as 18 mg. per 100 c.c.—W. D. H.

HEART

3848. Über die Ursachen der Unterschiede in der Herznervenerregbarkeit bei Fröschen zu verschiedenen Jahreszeiten. Ein Beitrag zur Frage des peripheren Antagonismus von Vagus und Sympathikus und zur Beeinflussung der Herznerven durch Schilddrüsensubstanzen. K. Cori (*Arch. exp. Path. Pharm.*, 1921, **91,** 130-55).—It has long been observed that stimulation of the vagus in summer frogs does not cause cardiac inhibition. The author shows that this is due to the fact that sympathetic fibres run together with the vagus, and that at certain times of year (in summer) stimulation of the two is followed by the signs of sympathetic stimulation alone. It is not that the vagus is inactive

at such times, but merely that the sympathetic is hyperactive. If the sympathetic is paralysed by ergotamine, the vagus effect at once manifests itself. Similarly the application of an amount of physostigmine, by itself inactive, will alter a response showing no cardiac inhibition, to one in which inhibition is marked. During the winter it is likewise possible, by administering atropine, to elicit a sympathetic response to vagal stimulation. The change from the " winter " response to the " summer " response takes place at the mating season. At that time it is common to find frogs which respond to vagus stimulation by an inhibition of the heart provided their own circulation is intact. If, however, the heart is perfused with Ringer's solution, stimulation of the vagus no longer results in inhibition. It is striking that frogs taken at the time they are performing the sexual act always show a powerful inhibitory response. The author considers that the change in response at different times of the year is related to thyroid activity. Thyroid extract has the power to abolish the inhibitory response to vagus stimulation. The change in the response to vagus stimulation is not related to ionic content—that is to say, the " winter " response on the one hand, and the " summer " response on the other, are not affected by diminishing or increasing either the amount of Ca or K.—J. H. B.

3849. Exploration graphique des battements de l'oreillette gauche par la sonde œsophagienne. Léon Fredericq (*Arch. intern. de physiol.*, 1921, **17,** 227-8).—Réclamation de priorité vis-à-vis de Rautenberg. L'auteur a décrit ce procédé vingt ans avant Rautenberg.—L. F.

3850. Le paradoxe cardiaque. W. Libbrecht (*Arch. intern. de physiol.*, 1921, **16,** 448-52).—*Paradoxe du potassium.*—Un cœur de grenouille isolé, alimenté au moyen de Ringer sans potassium, finit par s'arrêter après avoir passé par une phase de ralentissement progressif. Ce ralentissement fait place à un arrêt immédiat mais temporaire si on reprend le Ringer avec potassium, même si la quantité de potassium est faible. On n'obtient plus ce paradoxe si le premier liquide de perfusion présente une réduction parallèle du K et du Ca. C'est le rapport $\frac{KCl}{CaCl^2}$ qui importe. Il semble exister une relation intime entre le paradoxe et le balancement des ions. *Paradoxe thermique.*—Une cœur accéléré pas la perfusion au moyen de Ringer très oxygéné, chauffé à 37°, s'arrête brusquement pour reprendre ensuite ses contractions si on le soumet à du Ringer à 17°. Pendant ces arrêts, le cœur conserve sa contractilité et son excitabilité.—L. F.

3851. Conduction in the Amphibian and Reptilian Heart. D. T. Barry (*J. Physiol.*, 1921, **55,** 423-8).—In these hearts the atrio-ventricular funnel does not conduct as a whole, but the resistance varies in its different parts, details of which are set out. The upward and downward paths are not necessarily identical. Resistance to upward conduction is reduced by electrical stimulation of the heart or of the vagus. Ventricular automatism is most marked at back and sides, indicating that these are not correlated with the chief conducting function.—W. D. H.

3852. Experimental Lesions of the Branches of the Auriculo-Ventricular Bundle of the Dog. F. M. Smith (*Arch. Int. Med.*, 1921, **84,** 453-66).—Complete block produced in branches of the A-V bundle produces characteristic electrocardiograms which are diagnostic of the lesion. Evidence is obtained that functional changes in the myocardium (produced by ligaturing branches of the coronary artery) influence the conduction of the impulse within the ventricles.—J. H. B.

3853. Vagal Stimulation in Paroxysmal Auricular Flutter. D. C. Wilson. **Rapid Re-excitation of Auricles, Circus Movement in Auricles.** T. Lewis, A. N. Drury, and C. C. Iliescu (*Heart*, 1921, **8,** 303, 311, 341, 361-89).—Largely of clinical interest, but must be read in original by the specialists interested.—W. D. H.

3854. A Study of the S-T Interval in One Thousand and Twenty-Eight Electrocardiograms. J. A. Buchanan (*Arch. Int. Med.*, 1921, **84,** 484-94).—The normal S-T interval varies from 0·24 to 0·28 seconds. The length varies with the heart rate. —J. H. B.

3855. Sur l'interprétation des phases terminales de l'électrocardiogramme. J. de Meyer (*Arch. intern. de physiol.*, 1921, **17,** 1-58).—L'électrocardiogramme normal ne se termine pas, comme ou l'admet généralement, avec la fin de la phase T. A la *portion systolique* QRST, qui correspond aux *courants d'action*, fait suite une *portion diastolique* due aux *courants de déformation*. D'ailleurs dans la phase T elle-même, il y a lieu de distinguer: (*a*) La *branche montante* (que l'auteur désigne par E) correspondant à la période d'intersystole (*tonosystole*) et à la période d'expulsion (*ergosystole*). (*b*) Le *sommet*, marquant le début de la clôture des sigmoïdes ou fin de l'ergosystole (FS). (*c*) La branche descendante (V) marquant le début du vide postsystolique. Puis vient D, la phase nouvelle de dilatation diastolique (en partie U de certains auteurs). L'auteur propose une nouvelle terminologie. P (systole se l'oreillette) deviendrait, A; le passage du faisceau de His deviendrait, H; QRS (systole ventriculaire) deviendrait, CAV; T branche montante deviendrait, E; T sommet (clôture des sigmoïdes) deviendrait, FS; T (branche descendante) deviendrait, V; le vide diastolique deviendrait, D. L'EKG serait représenté par AHCAVEFSVD au lieu de PQRST (Einthoven). —L. F.

3856. On the Relation of Pulse Pressure to the Output of the Heart. Ruth Skelton (*J. Physiol.*, 1921, **55,** 319-21).—Experiments with heart-lung preparations from dogs indicate that the product of pulse pressure by pulse rate is of no value as a measure of heart output.—J. A. C.

3857. Die Mechanik der Herzhypertrophie. R. Geigel (*Virchow's Arch.*, 1921, **229,** 353-61).—The author distinguishes between "excentric" and "concentric" hypertrophy. He regards the increased work performed by the heart against a high arterial pressure as producing an excentric hypertrophy which, in turn, maintains the high blood-pressure. Concentric hypertrophy is produced by the action of toxic products as, for example, in nephritis.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3858. Remote Results of Operations on the Pulmonary Orifice of the Heart. A. Carrel (*J. Exp. Med.*, 1921, **34,** 441-6).—Description of the effects of plastic operations. —C. L. E.

CIRCULATION

3859. Über die Kreislaufgeschwindigkeit bei experimentellen Anämien. P. Morawitz and G. Denecke (*Arch. exp. Path. Pharm.*, 1921, **91,** 37-45).—Samples of arterial and venous blood have been withdrawn from (1) normal, (2) anæmic rabbits by the process of cardiac puncture under urethane. Analysis of these samples showed that in anæmic animals the rate of circulation is increased and a higher percentage of the oxyhæmoglobin is used by the tissues.—J. H. B.

3860. Die systolische Welle des Venenspulses. H. Gerhartz (*Deutsch. med. Woch.*, 1921, **47,** 893-4).—The venous pulse tracing shows two elevations: one at the beginning and the other at the height of auricular systole. The author believes that the "Karotiszacke" in the venous pulse is arterial, and transmitted from the aorta or its chief branch.—W. D. H.

3861. The Circulation through the Lungs. S. W. F. Underhill (*Brit. Med. J.*, 1921, ii., 779-82).—The results of ligature of the left pulmonary artery in cats, with the chest open, and under artificial ventilation, are those described previously (Abstract No. 2171, Vol. VI., p. 315). If the chest is closed after the artery has been ligatured, the animal

remains in good condition. Its respiratory rate is usually faster than normal, frequently double, but the depth tends to be shallow. The left lung may contain more blood than the right; this blood comes from the bronchial arteries, and stagnates in the pulmonary capillaries. Ligature of the right bronchus in cats, with the chest open, and under artificial ventilation, causes a small immediate rise in pulmonary blood-pressure without affecting the carotid pressure. The saturation of the blood was always under 90%, even when the ventilation was increased. It is presumed that there is a certain amount of circulation through the right lung under these conditions.—D. H. de S.

3862. Physiology of Capillaries. II. The Reactions to Local Stimuli of the Blood-vessels in the Skin and Web of the Frog. A. Krogh (*J. Physiol.*, 1921, **55,** 412-22).—While the capillaries of the tongue of the frog are powerfully dilated by various chemical stimuli, the capillaries of the skin and of the web of the foot are practically unaffected by such stimuli. The skin capillaries do, however, possess tonicity, and can actively contract or, by relaxation of tonus, dilate independently of the arteries. Acetyl choline can cause arterial dilatation without affecting the capillaries. In contrast to the findings of Doi, Krogh finds that the dilator effect of histamine on the skin capillaries is only slight. Cutting off the blood-supply is the most powerful dilator stimulus for the skin capillaries, but the cause of the dilatation is not lack of oxygen. As for the arteries of the skin, while weak mechanical stimulation produces dilatation, stronger stimuli cause contraction. If the artery is pierced, it contracts at once so strongly that only a drop of blood is lost. The action of adrenaline in causing vaso-constriction is confined to the larger arteries, and is absent in the smaller ones and in the arterioles.—J. H. B.

3863. Die Reaktion der Capillaren auf mechanische Reize bei Nicht-Schwangern, Schwangern und Wöchnerinnen. E. Lennartz (*Pflüger's Arch.*, 1921, **191,** 302-11).—Mechanical stimulation accelerates the capillary flow by dilating the capillaries and by eliminating periodic stasis; the latter is especially prominent during pregnancy. Most of the observations were made on the skin of the nail-fold; in some situations—*e.g.*, arm—there is, after stimulation, also an appearance of capillaries previously invisible. —C. L. E.

3864. Zur frage der Contractilität der menschlichen Hautcapillaren. W. Parrisius (*Pflüger's Arch.*, 1921, **191,** 217-33).—After a review of the German literature dealing with the question, the author describes 6 observations on patients' skin capillaries purporting to prove that the capillaries are contractile; sometimes the contractions are peristaltic and sometimes take the form of segmenting constrictions.—C. L. E.

3865. Die Regulierung der Blutverteilung in den Kapillaren. U. Ebbecke (*Die Naturwissenschaften.*, 1921, **9,** 629-37).—A review, in which special emphasis is laid on the contractility of the capillaries. Although the idea is an old one, it is only within recent years that it has been supported by tangible evidence; this is fully discussed. The three chief arguments in favour of capillary contractility are Ebbecke's observations (*Centralbl. f. Physiol.*, 1914, 725; see also Abstract No. 2510, Vol. II., p. 602) on local vaso-motor reactions; Dale and Richards's and Dale and Laidlaw's work on the action of histamine (Abstracts Nos. 1867, Vol. III., p. 334; and 757, Vol. IV., p. 122); and Krogh's investigations on the oxygen supply to the tissues (Abstract No. 1064, Vol. IV., p. 172).—C. L. E.

3866. Studien zur unspezifischen Reiztherapie. Teil I.: Über das Vorkommen und den Nachweis physiologisch wirksamer Zellzerfallsprodukte im stromenden Blute. H. Freund (*Arch. exp. Path. Pharm.*, 1921, **91,** 272-302).—An important paper on a subject at present attracting much attention in Germany. Clark showed in 1913 that an alcohol-soluble constituent of serum could revive a frog heart which, after many hours' perfusion, had lost its contractile force. Since then it has been shown that serum, like atropine, can restart a frog heart stopped by muscarine; that it can act

synergically with digitalis; that it contains vaso-dilator and vaso-constrictor substances. Some have attributed these actions to changes in the serum colloids, but Freund now shows that they are due to the presence of an alcohol-soluble substance probably identical with Clark's substance. The substance, whatever it is, is not present in circulating blood in healthy men or animals. Thus, if blood from the carotid artery is received into alcohol, no activity is present when the extract is prepared. While the fresh blood of normal rabbits is inactive, the blood of rabbits suffering from coccidiosis contains the active substance. Similarly after bleeding or injection of caseosan, the substance appears. With reference to the vaso-dilator and vaso-constrictor effects, Freund finds that they are developed in blood at different times after injection of caseosan. (Their existence is demonstrated on the Läwen-Trendelenburg preparation of the frog.) Thus 1 hour after caseosan injection, only dilator substances are present; 48 hours later blood taken from the rabbit and extracted with alcohol gives an extract which causes vaso-constriction. The dilator substances are still there, and are revealed by the addition of atropine. The author supposes that the substance or substances produced in various ways are due to increased cell breakdown; he points out that Clark found that continuous perfusion of the frog heart with the same small volume of fluid led to the appearance in the fluid of substances which, like serum, could revive a hypodynamic heart.—J. H. B.

RESPIRATION

3867. Direct Measurement of the Oxygen Pressure in Human Blood. J. Barcroft and M. Nagahashi (*J. Physiol.*, 1921, **55,** 339-45).—A bubble of air is brought into equilibrium with the blood and then analysed by a micro-method. Oxygen pressures of venous bloods thus measured agreed with the values calculated from the data of Christiansen, Douglas, and Haldane.—C. L. E.

3868. The Oxygen Content of the Mixed Venous Blood and of the Volume of Blood circulating per Minute. J. Barcroft, F. J. W. Roughton, and R. Shoji (*J. Physiol.*, 1921, **55,** 371-80).—A person breathing normally through valves makes a deep expiration, and is then connected to a bag of nitrogen, from which he inspires deeply and subsequently takes 4 or 5 ordinary breaths, all the expired air being rejected by the valves; an alveolar sample is then at once collected and analysed. Evidence is given that after a few seconds of nitrogen breathing the O_2 pressure of the alveolar air remains constant for several further seconds, and presumably represents the pulmonary venous O_2 pressure. The CO_2 pressure is, however, too low, and this makes the O_2 pressure also lower than normal in the venous blood; this introduces an error of about 2·5% in the observed oxygen saturation of the blood. From the coefficient of utilisation thus determined the minute volume can be calculated.—C. L. E.

3869. Variations in Alveolar Carbon Dioxide Pressure in Relation to Meals. E. C. Dodds and T. Bennett (*J. Physiol.*, 1921, **55,** 381-8).—The fall in CO_2 pressure (see also Abstract No. 1312, Vol. VI., p. 195) 1 to 2 hours after a meal is due to the secretion of alkali below the pylorus; this fall is prevented by local application of atropine to the duodenum. Evidence is given that the formation of secretin by acid is not necessarily an important factor in producing pancreatic secretion. Gastric lavage with atropine prevents the rise of CO_2 pressure observed soon after a meal, but the aforementioned fall still occurs.—J. A. C.

3870. Descrizione di un apparecchio per la misurazione della profondita del respiro nei bambini. D. Pacchioni (*Riv. di clin. pediatr.*, 1921, **19,** 170-9).—The apparatus consists of a kind of rubber water-pump which is activated by the respiratory move-

ments. The relation between the volume of water expelled and the actual lung ventilation is known from previous comparison with a standard respirometer.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

ALIMENTARY CANAL

3871. Zum Studium der Speichelsekretion. I. Über die Sekretion der Parotis des Pferdes. II. Über die Sekretion der Parotis und Mandibularis des Schafes. III. Kritik und Schlussfolgerungen. A. Scheunert and A. Trautmann (*Pflüger's Arch.*, 1921, **192,** 1, 33, 70-80).—I. Secretion of parotid saliva commences after 10 to 20 masticatory movements. There is no psychic secretion and no conditional reflex secretion; chemical stimuli are weak, the chief normal stimulus being a mechanical one from the masticatory movements of the ipsilateral jaw. The parotid saliva contains no amylase and shows no chemical adaptation to the nature of the food. The modifications of structure and activity of the glands wrought by the establishment of fistulæ are discussed in relation to all the observations. II. In the sheep the parotid secretes continuously at the rate of 2 to 2½ c.c. per minute; this continuous secretion is of the greatest importance, since it serves to keep the contents of the first 3 stomachs moist and of low acidity, as the secretion is very alkaline. During feeding there is only a trivial increase in the rate of secretion or in its composition, and on exhibition of food only a slight psychic acceleration. The mandibular gland stands in strong contrast, only secreting during the taking or exhibition of food, and not during digestion or rumination; it is almost neutral and very mucilaginous, shows marked adaptation to different varieties of food, and secretion is independent of the side of the mouth on which the food is chewed. Neither alone nor mixed with parotid saliva does it show diastatic action. Animals with permanent external fistulæ of either or both glands did not remain in normal health. The resultant changes in the glands are described fully. III. A general discussion of the carefully executed researches described in the preceding 2 papers. The authors appear dubious as to the interpretation of permanent fistula experiments even in dogs; most of the glands show fibrotic changes, and unless histological examination is made in each case, results cannot be correctly interpreted.—C. L. E.

3872. Effects of Pilocarpine upon Salivary Secretion in Dogs. H. G. Barbour and B. P. Freedman (*Amer. J. Physiol.*, 1921, **57,** 387-94).—The salivary gland develops an increasing sensitivity to the drug during repeated injections. This has not been explained. In the abnormally high concentration of the blood at the height of coli fever the response is decreased, owing to lack of available water rather than to " cloudy swelling " of an indefinite nature.—W. M. B.

3873. Die Aussichten der Behandlung von Motilitätsstörungen des Magens durch Vagusunterbrechung. E. Borchers (*Deutsch. Zeit. f. Chirurg.*, 1921, **162,** 19-28).—Five days after section of the vagi in cats operative effects had passed off and the peristaltic movements of the stomach again became normal. Even section and suturing of the stomach did not interfere with the movements, except that the peristaltic waves refused to pass over the sutured junction. Electrical stimulation of the vagus leads to inhibition of the cardiac sphincter, and the actions of atropine and pilocarpine are independent of the nerve.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3874. La secrezione gastrica nel neonato ancora digiuno. R. Pollitzer (*Pediatria*, 1921, **29,** 253-9).—In unfed new-born infants rennin is found to be already present in the gastric juice; it is probably called forth by the swallowing of amniotic fluid. HCl is not secreted until after birth, but rapidly increases in concentration. These facts are true of premature as well as of full-time babies.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3875. Gastric Juice. II. On the Action and Properties of the Gastric Lipase. M. Takata (*Tohoku J. Exp. Med.*, 1921, **2**, 209-57).—The gastric lipase of Volhard was invariably found in the secretion of the small stomachs of 12 "Pavloff" dogs. The juice secreted between meals is more strongly lipolytic than that secreted during active digestion; 30 minutes after a meal, the juice secreted had no lipolytic action, but if the pouch was washed out with saline just before collecting the juice, a lipase could always be detected throughout the whole period of digestion. Its presence is masked by the increased acidity of the secretion, which tends to destroy it altogether. The following are some of its properties: it withstands drying, keeps well at low temperatures, is protein free and non-filterable. The action of the lipase on several esters and emulsified fats have been examined. The effect of the reaction of the substrate on the ferment shows that activity is possible within fairly wide limits (P_H 2·5 to 8); the optimum reaction is P_H 4·9. The author points out that the reaction of the stomach contents within an hour after meals is about P_H 4 to 5, and is therefore compatible with lipolytic activity.—R. K. S. L.

3876. La raison d'être de l'estomac des gnathostomes. A. Lameere (*Bull. soc. sc. méd. et nat. de Bruxelles*, 1921, 125-31).—Etude des motifs qui ont fait apparaître chez les vertébrés gnathostomes l'estomac en amenant l'allongement du pharynx dont les cellules se sont mises à sécréter de la pepsine et de l'acide chlorhydrique. Si l'homme posséde un estomac, c'est à cause du mode d'alimentation des premiers sélaciens.—E. Z.

3877. Étude expérimentale de l'influence de l'histamine sur la sécrétion gastrique. E. Rothlin et R. Gundlach (*Arch. intern. de physiol.*, 1921, **17**, 59-84).—Les auteurs ont constaté chez un chien ayant subi l'opération du petit estomac de Pawlow que l'histamine en injection sous-cutanée (0·0033 à 0·02 mgr. par Kgr.) excite fortement la sécrétion gastrique (action succagogue plus forte que peptogène) ainsi que la motricité stomacale (action parasympathomimétique, c. à d. comparable à une excitation du vague). On savait que l'histamine agit comme excitant sur la motricité du tractus gastro-intestinal, à la façon du vague ou parasympathique, tandis que l'adrénaline a une action antagoniste (analogue à celle du sympathique). L'injection intraveineuse d'histamine est inefficace: en application entérale, elle est peu active (faible résorption intestinale). La sensibilité du mécanisme sécrétoire gastrique envers l'histamine est pour ainsi dire la même à jeun, pendant et après la digestion; le mécanisme sécrétoire ne se fatigue donc pas pendant le travail secrétoire normal. L'histamine joue peut-être un rôle physiologique pour la sécrétion gastrique, car on a constaté sa présence dans l'épaisseur de l'intestin normal. On pourrait songer à l'employer en médecine.—L. F.

3878. Eine neue einfache Bestimmung der Magensalzsäure. L. v. Friedrich (*Deutsch. med. Woch.*, 1921, **47**, 1258).—An easy method, requiring only small amounts of gastric juice, is to estimate the HCl colormetrically with Congo-paper.—W. D. H.

3879. Formation of the Gastric Acid. J. B. Collip (Univ. of Toronto Studies, Physiol. Ser., No. 35, 1920, pp. 46).—A micro-chemical study by the use of Macallum's methods; in the resting mammalian stomach the cytoplasm of the parietal cells contain phosphates and carbonates, but no chlorides; when the stomach is active chlorides are present. The chief cells are free from these salts at all times. The salts, when present, are uniformly distributed, or less commonly condensed about the nucleus. The interstitial tissue of the mucosa is rich in the salts, and condenses in the lymph on the surface of the tubules, which draw in the supply as their activities determine. Polychrome B shows the cytoplasm of parietal cells when active is acid, probably owing to sodium dihydrogen phosphate. Much the same is true (with small differences of detail) for fowl, turtle, and frog. HCl is liberated as such at the luminal border, as shown by the reaction with sodium ferrocyanide and ammonium ferric citrate. Maly's theory of

HCl formation (interaction of NaCl and NaH_2PO_4 in the cells) is supported.—W. D. H.

3880. The Acidity of Gastric Contents. W. Lanz (*Arch. Verdauungskrankh.*, 1921, **27,** 282-352).—A valuable critical discussion of the problem of the estimation and significance of gastric acidity. The conclusions are that the actual acidity is best determined by the gas-chain method; however, for secretion poor in protein good results are given by the indicator series: methyl violet, dimethylamino-azobenzene, methyl red, *p*-nitrophenol, rosolic acid or neutral red, naphtholphthalein. Titration with phloroglucinol vanillin gives only approximate results. The "true" acidity—*e.g.*, the true base-combining power of the juice—cannot be measured. Instead the "total acidity" or the "neutralising power" is measured, and is not much different in protein-poor juice from the "true" acidity. This is estimated by titration with 0·1 *N* NaOH and phenolphthalein as indicator. The potential acidity cannot be directly measured, but is obtained by subtracting the "actual" acidity from the "total" acidity.—W. D. H. (*Chem. Abstr.*).

3881. Psychic Gastric Secretion in Man. G. R. Heyer (*Arch. Verdauungskrankh.*, 1921, **27,** 227-40).—A patient was put to sleep by suggestion, and his stomach was emptied; hypnotic suggestion or "psychic" feeding of blood, milk, or bouillon for 2·5 minutes produced an increase in gastric secretion accompanied by an increase in proteolytic activity. These psychically induced alterations lasted for only a few minutes, and not for hours, as Pavloff reported; but they are none the less striking. W. D. H. (*Chem. Abstr.*).

3882. Über die Störung der Salzsäuresekretion des Magens bei Erkrankung der Gallenblase. M. Behm (*Deutsch. med. Woch.*, 1921, **47,** 993-4).—In diseases of the gall-bladder, the HCl of the gastric juice is lessened; this condition remains after the gall-bladder is opened or removed.—W. D. H.

3883. Physical Characters and Enzymatic Activities of Duodenal Contents during Gastric Digestion in Normal Young Men. C. W. McClure, A. S. Wetmore, and L. Reynolds (*J. Amer. Med. Assoc.*, 1921, **77,** 1468-9). **Fractional Examination of the Normal Duodenal Contents.** J. Friedenwald and J. Sindler (*ibid.*, 1469-71). **In Peptic Ulcer.** M. Einhorn (*ibid.*, 1471-4).—The first paper gives details of experiments on 7 subjects. —C. L. E.

3884. Cholin als Hormon der Darmbewegung. V. Experimentelle Therapie der Magen-Darmlähmung nach Chloroformnarkose. M. v. Kühlewein (*Pflüger's Arch.*, 1921, **191,** 99-107).—Gastro-intestinal stasis after 2 hours of deep chloroform anæsthesia was demonstrated in cats by the X-ray method; the absolute stasis lasted for 2 hours, and was followed by impaired motility for 20 hours. Intravenous injection of 0·005 to 0·015 g. per Kg. of choline HCl overcame the stasis, and also stimulated the large intestine; there was no harmful effect if slowly injected. The stasis following $CHCl_3$ does not appear to be due to loss of choline, but rather to paralysis of Auerbach's plexus; at all events, dialysates from the intestines of normal and chloroformed cats, whether used direct or acetylated, had quantitatively similar effects on rabbit's bowel. —C. L. E.

3885. Influence des excitations corticales et de l'anémie sur les mouvements de l'intestin grêle. E. Wertheimer (*Arch. intern. de physiol.*, 1921, **17,** 193-208).—L'excitation du *gyrus sigmoïde* (lèvres antérieure ou postérieure) provoque chez le chien une inhibition du tonus et des mouvements de l'intestin grêle, parfois précédée ou suivie d'un renforcement des contractions. L'occlusion de l'aorte agit dans le même sens: il en est de même de l'oblitération de l'artère mésentérique supérieure. Il est probable que la vaso-constriction qui se produit dans le territoire du splanchnique à la suite de l'excitation corticale, associe son action à celle des nerfs inhibiteurs pour amener

l'arrêt des mouvements de l'intestin. Après la section des deux pneumogastriques, l'excitation du gyrus peut provoquer encore un renforcement très marqué des mouvements de l'intestin: le nerf splanchnique fournit donc, sans doute, à l'intestin grêle, non seulement des fibres d'inhibition, mais aussi des fibres excito-motrices.—L. F.

3886. Testing the Function of the Liver by Induced Glucuronic Acid Excretion. M. Chiray and E. Caille (*Bull. mem. soc. méd. hosp.*, 1921, **45,** 383-95).—This test is based on the idea that the liver is the main organ in which glucuronic acid is formed. The estimation of glucuronic acid excreted in the urine after camphor is given yields an index of the functional capacity of the liver. The test is called "induced glucuronuria." In normal individuals who have previously been on a low meat diet, and who have an empty intestine, the acid rises within 6 hours from 20 to 30 mg. to about 180 mg. per litre as a result of the ingestion of the camphor.—W. D. H. (*Chem. Abstr.*).

3887. Die Rolle der Sternzellen im Bilirubinstoffwechsel. V. Schilling (*Berlin. klin. Woch.*, 1921, **58,** 881-2).—The author doubts whether the Kupffer cells have any special function in relation to the breakdown of blood-pigment.—W. D. H.

3888. Ricerche istologische in rane sottoposte all' ablazione del fegato. V. Ronca (*Arch. per le sc. med.*, 1921, **44,** 45-59).—Frogs may survive for a fortnight after the removal of the liver. The kidneys are then most affected; diffuse congestion and degenerative changes of the tubular epithelium are seen. In the central nervous system diffuse chromatolysis associated with vacuolisation of the cytoplasm, atrophy, and pycnosis of the nucleus occur. In the blood the hæmoglobin content is diminished, while the metachromatic substance of the granulo-filamentous erythrocytes is increased. In the pancreas limited parenchymatous changes are sometimes observed, but the secretory function of the organ is not affected. In the congested spleen a fragmentation of the red corpuscles of varying intensity is noticed. In the intestine there is congestion, but no alteration of the epithelium and glands.—C. d. F.

3889. The Liver as a Blood-Concentrating Organ. P. D. Lamson and J. Roca (*J. Pharm. Expt. Ther.*, 1921, **17,** 481-97).—The disappearance of intravenously injected saline from the blood is due in large part to the action of the liver, for if the liver is removed the rate of disappearance is decreased 4 times. If adrenaline is added to the injected fluid the rate of disappearance in the normal animal is greatly increased, but it has no effect if the liver has been removed. Adrenaline increases the obstruction to the hepatic flow of blood by constricting the hepatic veins, thereby raising the filtration pressure in the liver capillaries and concentrating the blood. It is pointed out that the addition of adrenaline to intravenous salt infusions given for the purpose of raising blood-pressure accelerates fluid loss and should be discouraged.—E. M.

3890. Über den Choledochus-Sphinkter. F. Reach (*Arch. exp. Path. Pharm.*, 1921, **91,** 170-2).—Experiments on decapitated guinea-pigs show that the sphincter of the bile duct is controlled by the contents of the stomach. Filling of the stomach causes closing of the sphincter, and emptying causes the sphincter to open.—J. H. B.

VITAMINS

3891. Die Rachitis als Avitaminose. W. Stoeltzner (*Münch. med. Woch.*, 1921, **68,** 1481-2).—The author is convinced of the importance to be attached to the presence of vitamin A in a diet in order that rickets may be avoided, but not that rickets is simply a deficiency disease. He quotes the experiments of Findlay on the effect of confinement, and points out that Lasch has shown how exposure to light benefits rachitic children, so that they are able to utilise Ca to a greater extent. He also refers to the curative action of castration in many cases of osteomalacia. The author agrees with

Funk and Hopkins that in the ætiology of rickets an endocrine factor may be involved. While, however, Funk's suggestions concerned the thymus, and Hopkins's the thyroid and pituitary, Stoeltzner attaches importance to the suprarenals.—J. H. B.

3892. Experimental Rickets. VI. Rats on Calcium-Poor Diet. VII. Use of Cod-Liver Oil and Butter. E. V. McCollum, Nina Simmonds, P. G. Shipley, and E. A. Park (*Amer. J. Hygiene*, 1921, **1,** 492-511, 512-25; compare Abstract No. 3466, Vol. VI., p. 509).—VI. The rats received diets low in Ca (but sufficient in vitamin A and phosphates) developed bones which resemble those in human rickets, but differ from it in that the growth zone of cartilage is normal, and bone resorption in the diaphysis is excessive. $CaCO_3$ added to the diet prevents the disorder; so does cod-liver oil. The latter food given later heals the lesion, but osteoporotic bone is formed. Butter fat in amounts sufficient to prevent keratomalacia is a very inefficient protection against the bone lesions. VII. The last-mentioned results suggest that cod-liver oil contains a dietary essential (x) distinct from vitamin A, and nearly absent from butter; x, even on a Ca poor diet; but normal P directs bone development towards the normal. When the Ca and P of the diet are normal, the need of x is small and can be met by butter, but in Ca starvation there is need for more x. Excellent plates complete the papers.—W. D. H.

3893. Cod-Liver Oil in Rickets. E. A. Park and J. Howland (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 341-4).—A radiographic study with plates and records of 50 cases. Cod-liver oil is regarded as a specific cure, and its beneficial results can be seen in the radiograms.—W. D. H.

3894. Vitamin Deficiency and Rickets. Amy Hodgson (*Lancet*, 1921, ii., 945-9).—The author summarises a good deal of recent work on the subject. Speaking from her own experience in Infant Welfare Centres in Liverpool, she states that rickets occurs on every type of dietary. Her own work has been mainly on the urine in a small number of cases. She admits the difficulty of dogmatising on such a basis, but considers that the lowering of alkaline reserve (which she finds) is an important factor, and considers that this should be taken into account in preventive measures and in treatment. She sometimes speaks of this as acidosis, and apparently does not recognise that lowering of the blood alkali does not necessarily imply acidæmia.—W. D. H.

3895. Factors influencing the Nutritive Value of Lard and Lard Substitutes. J. C. Drummond (*J. Soc. Chem. Ind.*, 1921, **40,** 81-4T).—See Abstract No. 395, Vol. VI., p. 60.—W. D. H.

3896. The Sensitivity to Poisons of those Suffering from Vitamin Deficiency. W. S. v. Leeuwen and F. Verzár (*Verslag. Akad. Wet. Amsterdam*, 1920, **29,** 654-8).—When fowls and cats were fed on food deficient in vitamins, the organs did not show any change in sensitivity towards adrenaline, histamine, choline, and atropine. There is no stimulating effect of atropine in the intestines of fowls fed on polished rice.—W. D. H. (*Chem. Abstr.*).

3897. Vitamins. VII. Fresh Alfalfa and Cockerel's Testes. R. A. Dutcher and S. D. Wilkins (*Amer. J. Physiol.*, 1921, **57,** 437-43).—On polished rice the testes in White Leghorn cockerels did not develop, or if developed before atrophied. This can be counteracted by adding small amounts of fresh alfalfa to the diet; this is attributed to vitamin.—W. D. H.

3898. Vitamin B and the Nutrition of Dogs. G. R. Cowgill (*Amer. J. Physiol.*, 1921, **57,** 420-36).—The author confirms Karr that the dog's desire for food is related to the amount of this vitamin in the diet. Alcoholic extracts of wheat embryo, rice polishings, and navy bean are appetisers. These extracts (and tomato juice) cure polyneuritis caused by deficient diet in dogs and birds.—W. D. H.

3899. Weitere Beiträge zur Kenntnis von organischen Nahrungsstoffen mit Spezifischer Wirkung. E. Abderhalden and E. Wertheimer (VII.); E. Abderhalden (VIII.)

(*Pflüger's Arch.*, 1921, **191,** 258-77-301).—VII. Extracts of yeast or bran increase the gaseous metabolism of various tissues (well known). Casting round for other substances that do the same thing, the authors get positive results with glutamine, glutaminic acid, pyrrolidinecarboxylic acid, tryptophane, rape oil, cod-liver oil, valerianic, formic, tartaric, citric, oxybutyric, oxyisocaproic, lactic, pyruvic acids, hexose phosphate, glycero-phosphate, arsenites, and various antiscorbutic juices. Yeast extract also acccelerated plant respiration. The effect of light on the respiration of human blood is nil; if eosin is added, diffuse light accelerates and bright light inhibits respiration. VIII. Guinea-pigs fed on scorbutic diets had a lowered gaseous exchange, which was raised by yeast administration. Administration of cystine or of peptone from feather, hair, or guinea-pig skin hydrolysis did not affect the growth of hair.—C. L. E.

3900. Vitamins and Teeth. P. R. Howe (*J. Dental Res.*, 1921, **3,** 7-12).—The theory that lactic acid formed by fermentative processes in carbohydrates lodged between the teeth produces caries is thought to be doubtful. No caries occurred in guinea-pigs fed for 6 to 12 months on abundant sugar and starch. If the animals are fed on rolled oats, fat-free milk, a small piece of carrot, and a lettuce leaf every day or every other day decalcification of bones and teeth took place (illustrated by photographs), also caries and other symptoms. Recalcification took place with the addition of more green food or orange juice to the diet.—W. D. H.

3901. Heating the Antiscorbutic Vitamin in the Presence of Invertase. E. Smith and G. Medes (*J. Biol. Chem.*, 1921, **48,** 323-7).—Invertase does not contribute towards the destruction of the antiscorbutic vitamin.—J. C. D.

3902. Antiscorbutic Properties of Milk. E. V. Anderson, R. A. Dutcher, C. H. Eckles, and J. W. Wilbur (*Science*, 1921, **53,** 446).—Oxidation is more important than heating for destroying the vitamin.—W. D. H. (*Chem. Abstr.*).

METABOLISM

3903. Basal Metabolism Estimation by CO_2 Method. J. T. King and R. Pearl (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 277-89).—This simple method is easy, inexpensive, and is stated to give as accurate as or even more accurate results than oxygen estimations. I can find no allusion to Waller's work in the paper.—W. D. H.

3904. The Influence of Work on Metabolism. D. Rancken (*Finska Läk. Handl.*, 1921, 277-83).—Observations made in a Sonden-Tigerstedt respiration chamber. The subject was a doctor æt. 45. From the CO_2 expired, the amount of carbon burnt per hour was calculated, and this varied from 5 at rest to 50 gm. when running. Work of intermediate hardness gave intermediate results.—W. D. H.

3905. Ricerche di calorimetria. II. La produzione di calore nello iuviluppo ontogenetico del bufo vulgaris. T. Gayda (*Arch. di Fisiol.*, 1921, **19,** 211-42).—A differential calorimeter (Abstract No. 3016, Vol. VI., p. 440) was used. In the eggs of *B. vulgaris* immediately after fecundation the production of heat averages 0·037 cal. per hour per gm. It then rises, and reaches about 0·27 cal. when the tadpole leaves the egg. When these begin to swim it reaches a maximum of 0·95 cal. It gradually decreases to about 0·34 cal. at the end of the metamorphosis. The increased production of heat in the developing eggs appears to be due to the formation of the segmentation spheres, while the volume of the whole egg remains unaltered. The increased heat production observed in the tadpoles is connected with the muscular contractions necessary for swimming. The subsequent decrease is due to the diminished relation between body surface and volume. The total quantity of heat produced by the developing eggs in 8 days averages 30 cal. per gm., or 0·12 cal. per egg. That produced by the tadpoles in

120 days is approximately 1,668 cal. per gm. of tadpoles, or 67 cal. per tadpole. The total quantity of heat produced by 1 gm. of tadpoles while doubling their body weight is the greater the older the tadpoles are. The heat production in adult toads is approximately the same as in tadpoles; it oscillates between 0·29 and 0·51 cal. per hour and gm. of body weight; it is greater in males than in females.—C. d. F.

3906. Observations on the Effects of Fat Excess on the Growth and Metamorphosis of Tadpoles. R. McCarrison (*Proc. Roy. Sci.*, 1921, **92B**, 295-303).—An excess in the food of tadpoles of the several fats used caused great retardation in the rate of growth. Iodine in amounts of 0·5 to 1·0 mgr. per gm. of food mixture tended to compensate for the retardation of growth induced by butter, oleic acid, cocoanut oil, and arachis oil, but not for that induced by linseed oil and cod-liver oil. The normal rate of metamorphosis was but slightly affected by the harder fats, butter, cocoanut oil, and lard, but was delayed by the fluid and less saturated fats, oleic acid, arachis oil, linseed oil, and cod-liver oil. The delayed rate of normal metamorphosis induced by the fluid fats tended to be compensated for by the presence of small quantities of iodine in the food in the case of oleic acid and arachis oil, but was not compensated for by the same quantities of iodine in the case of linseed oil and cod-liver oil. The abnormal metamorphosis induced by a high iodine intake was considerably hastened by a high proportion of butter in the food mixture, and to a lesser degree by a high proportion of cocoanut oil in the food mixture, but was markedly retarded by a similar proportion of cod-liver oil in the food mixture. It seems probable from these results that in so far as certain fats—butter, oleic acid, cocoanut oil, and arachis oil—are concerned, an iodine intake, proportionate to their intake in the food, is requisite for the maintenance of normal metabolism. The influence of cod-liver oil and of linseed oil in further retarding growth in the presence of an amount of iodine that is favourable to growth in the case of other fats is as yet not understood.—*Author's Abstract.*

3907. Calcium Ingestion and Equilibrium. O. Loew (*Vierteljahrs. ges. Med.*, 1921, **61,** 151-4), M. Rubner (*ibid.*, 155-60).—Polemical.—W. D. H.

3908. Über die Wirkung der künstlichen Höhensonne auf den Stoffwechsel. W. Lasch (*Deutsch. med. Woch.*, 1921, **47,** 1063).—Rachitic infants improve if irradiated from the quartz lamp. Metabolism experiments on 3 children showed an increased retention of Ca and P (compare Hess and Unger, Abstracts Nos. 3467-8, Vol. VI., p. 510).—W. D. H.

3909. Fat of Rabbits. S. T. Dowell (*Science*, 1921, **53,** 487).—Rabbits were fed on peanuts and alfalfa; one was then killed, and others at varying times after inanition. The liquid fat is used during starvation more rapidly than solid fat; the fat of back and under the skin is used before that around the kidney. The work is to be repeated on pigs.—W. D. H. (*Chem. Abstr.*).

3910. The Mineral Constituents of Potatoes and Potato Flour. C. E. Mangels (*J. Ind. Eng. Chem.*, 1921, **13,** 418-9).—Comparison is made in tables of results of estimations of CaO, MgO, K_2O, P_2O_5, S, and Cl_2 in potatoes, potato flour from peeled potatoes bolted, and flour from unpeeled potatoes unbolted. These constituents vary in different samples. Flour contains a smaller relative amount of total ash and a very slightly smaller amount of K_2O than the corresponding fresh potato. The " hot drum " process does not appreciably change the relative distribution of mineral constituents, and the nutritive value of flour with respect to these constituents is practically the same as that of fresh vegetable.—W. D. H. (*Chem. Abstr.*).

SUGAR AND DIABETES

3911. Über den Gehalt der roten Blutkörperchen an Traubenzucker und Chlor. M. Bönninger (*Biochem. Zeit.*, 1921, **122,** 258-9).—Falta and Quittner (Abstract No. 1262, Vol. VI., p. 18) maintain that glucose and NaCl are not found in the corpuscles. The author, like many others, cannot confirm this.—H. K.

3912. Parasympathicusgifte und Blutzucker. A. Bornstein and R. Vogel (*Biochem. Zeit.*, 1921, **122,** 274-84).—Excitants of the parasympathetic nervous system, such as pilocarpine, physostigmine, choline, and acetyl choline, increase the blood-sugar content of normal dogs. Atropine inhibits (to a greater or lesser extent) this glycæmia. In some diabetic patients intravenous administration of atropine depresses the sugar content of the blood.—H. K.

3913. Phosphatinjektion und Blutzucker. H. Elias and S. Weiss (*Berlin. klin. Woch.*, 1921, **56,** 959-60).—The normal blood-sugar is unaffected by intravenous injections of Na_2HPO_4 or NaH_2PO_4; in alimentary hyperglycæmia and usually in diabetes the sugar is lessened.—W. D. H.

3914. Sugar in Blood of Atrophic Infants. R. A. Guy (*Quart. J. Med.*, 1921, **15,** 9-17).—This is usually low, but cannot be used as an indication of carbohydrate absorption.—W. D. H.

3915. Ether Hyperglycæmia and Glycosuria in the Rabbit. I. Fujii (*Tohoku J. Exp. Med.*, 1921, **2,** 169-208).—The hyperglycæmia and glycosuria induced by ether is only partially a sympathetic effect. Rabbits narcotised after bilateral splanchnectomy continue to exhibit both phenomena, but not so markedly as after unilateral splanchnectomy, when the sugar disturbance is as severe as in normal animals. The adrenaline content of the adrenals is diminished (on both sides) in normal animals, on the intact side only after unilateral splanchnic section, and is unaltered after double section. The glycosuria may be obviated by preventing a fall of body temperature, but this precaution has no effect on the hyperglycæmia.—R. K. S. L.

3916. Recherche sur le rôle du pancréas dans l'assimilation nutritive. N. C. Paulesco (*Arch. intern. de physiol.*, 1921, **16,** 85-109).—L'injection intra-veineuse d'un extrait pancréatique provoque chez un animal rendu diabétique par l'ablation du pancréas: une diminution ou même une suppression passagère de l'hyperglycémie et de la glycosurie, une diminution notable de l'urée et de l'acétone du sang et des urines. L'effet se montre immédiatement après l'injection d'extrait pancréatique, atteint son summum au bout de 2 heures et se prolonge pendant environ 12 heures. Il varie suivant la quantité de pancréas ayant servi à faire l'extrait. L'injection d'extrait pancréatique produit chez l'animal normal une hypoglycémie ainsi qu'une diminution de l'urée du sang et de l'urine. L'injection intra-veineuse de sérum physiologique ou d'extraits d'autres organes ou de nucléinate de soude reste sans effet.—L. F.

KIDNEY AND URINE

3917. Histochemical Studies on the Mechanism of Renal Secretion. E. J. Stieglitz (*Amer. J. Anat.*, 1921, **29,** 33-89).—A study of the passage of iron, injected in the form of ferric ammonium citrate, through the cells of the convoluted tubules. The iron is liable to be stored up in the cells, and thus to hinder the secretion of water and other substances. Experimental nephritis induced by uranium, tartrate, chromate, or sublimate is accompanied by increased difficulty in the excretion of the iron, but the vascular changes of diphtheria nephritis are without effect.—T. R. P.

3918. Conseguenze della nefrectomia nei topi siamesi diseguali. B. Morpurgo (*Atti R. Acc. Lincei*, Roma, 1921, **30 of V.S.,** 13-8).—The author has shown that if two rats or mice of different size are joined together by lateral cœliostomy a continuous flow of water takes place from the weaker animal towards the stronger (Abstract No. 3207, Vol. V., p. 513). He has now investigated this fact by nephrectomy carried out in one or the other or both twins. After bilateral nephrectomy of the weaker mouse compensation of the renal function is effected through the kidneys or even one kidney of the stronger one. Bilateral nephrectomy of the latter is not sufficient to stop the flow of water towards it. After bilateral nephrectomy in one animal and monolateral in the other the renal function is still carried out in an imperfect way, and there is a small increase in the amount of work effected by the remaining kidney; but a change of diet is enough to cause renal insufficiency, especially in the mouse deprived of both kidneys. The condition resembles human uræmia, but differs from the pathological condition seen in single animals after bilateral nephrectomy.—C. d. F.

3919. The Effect of Water Diuresis on the Elimination of Urinary Constituents. A. D. Carr (*J. Pharm. Expt. Ther.*, 1921, **18,** 221-36).—The experiments were made on normal men, who were given 200 to 250 c.c. of water 1 to 2 hours before the collection of the urinary samples. In spite of admittedly uncontrolled factors, the author claims to have determined that during water diuresis there is an increase in the absolute amount of sulphates and urea always, of ammonia and phosphates generally, of chlorides variably, and of creatinine not measurably. All these are decreased in percentage, but carbonates are increased not only in absolute, but in percentage amount.—J. A. G.

3920. The Regulation of the Excretion of Water by the Kidneys. J. G. Priestley (*J. Physiol.*, 1921, **55,** 305-18).—Changes in the blood (slight dilution and passage of salts out of the blood) accompany diuresis consequent on water drinking. The excretion of water is largely independent of the excretion of chlorides. Injection of pituitrin delays the diuresis for 4 to 6 hours, the diuresis being accompanied by an increased excretion of chlorides. The regulation of excretion of water depends on the diffusion pressure of water in the blood and on the inability of the kidney to hold back water when the diffusion pressure of water in the urine is considerably below that of the blood. —J. A. C.

3921. Possible Error in Testing for Bence-Jones Protein. C. W. Miller and J. E. Sweet (*J. Biol. Chem.*, 1921, **48,** 21-2).—Dog's urine containing albumin may, on standing for some hours, give a false Bence-Jones reaction owing to proteolytic enzymes in the urine acting on the albumin. Toluene used as a preservative and emulsified with the urine may give the heat test. Fresh urine must therefore be used.—T. A. W.

ENDOCRINE SYSTEM

3922. Some Current Trends in Endocrinology. R. G. Hoskins (*J. Amer. Med. Assoc.*, 1921, **77,** 1459-62).—"There is no easy road to endocrinology, either to discovery or to knowledge already gleaned. . . . There are many problems demanding solution which require, not genius, but merely accuracy and patience, together with recognition of the ordinary criteria of evidence in any field."—C. L. E.

3923. Innere Sekretion und Nervensystem. W. Löffler (*Schweiz. Arch. f. Neurol. u. Psychiat.*, 1921, **8,** 163-83).—An address dealing discursively with the possible effects of various internal secretions on the nervous system.—W. D. H.

3924. Endocrine Organs (*New York Med. J.*, July 6, 1921, **114,** 1-55).—This is a series of papers in what the journal calls its "Endocrinology Number," and, as is natural, the clinical side is to the fore. High blood-pressure, dysmenorrhœa, eye

diseases, tinnitus aurium, deafness, epilepsy, etc., are all stated to have their endocrine side. The only papers out of the 16 which demand notice here are the following 3: *The Problem of the Adrenals*, by E. Gley (pp. 9-12). The theory of emergency action and that of vascular tonus due to adrenaline are considered untenable. The work of Abelous and Langlois on the antitoxic rôle of the adrenals should be considered, and, above all, the cortex demands renewed investigation. *Adrenal Cortex and Sexual Development*, by K. H. Krabbe (pp. 4-8). The theory that this forms a hormone controlling secondary sexual characters is disputed; it is not proved by the co-existence of virilism in women, and adrenal cortical tumours. This is ingeniously explained by the overgrowth of fœtal testicular cells absorbed by the cortex during development. *Pituitary Extract and Urine Formation in Man*, by R. McBrayer (pp. 53-5). During the first hour after subcutaneous injection the amount of water in the urine increases and blood-pressure falls.—W. D. H.

3925. The Internal Secretions in Disturbances of Metabolism and Digestion. Report given to the Homburg Meeting for Diseases of Metabolism and Digestion, September 26, 1920. A. Biedl (*Endocrin.*, 1921, **5,** 524-36).—The nature of the communication, originally given at Homburg (1920), is indicated by the title. A wide range is covered, and the paper does not lend itself to abstraction.—S. V.

3926. An Unusual Disturbance of Endocrine Glands. O. T. Osborne (*Endocrin.*, 1921, **5,** 574-6).—A diagnosis of a disturbance of the adrenals was based on bladder irritability, profuse perspiration, anaphylactic swellings, and the sluggishness of the bowels. The patient was converted into a "perfectly normal well woman" by the administration of suprarenal substance (whole gland).—S. V.

3927. Endocrine Problems in Pelvic Surgery. C. Rosser (*Endocrin.*, 1921, **5,** 537-42).—Three cases are reported: (1) Hypothyroidism with uterine displacement—treated with thyroid extract; (2) anterior pituitary deficiency with amenorrhœa and pelvic pain—treated with thyroid, ovarian, and pituitary extracts; (3) vicarious menstruation with "hypergonadism"—treated by double ovariotomy. The results were considered good enough to encourage a "discriminating appeal to hormone therapy" in pelvic disorders.—S. V.

3928. Action du sang, du plasma, des globules rouges normaux et asphyxiés sur l'intestin isolé. R. Pellegrini (*Arch. intern. de physiol.*, 1921, **17,** 209-26).—L'auteur n'admet pas l'existence de l'adrénaline dans le sang normal circulant, mais bien la présence fréquente dans le sang total hirudiné ou défibriné, dans le plasma, dans les globules rouges et dans le sérum, de substances tonifiantes ayant sur l'intestin une action antagoniste de celle de l'adrénaline. Ces substances sont thermolabiles et probablement associées avec des substances thermolabiles à action antagoniste. L'asphyxie exalte leurs propriétés.—L. F.

3929. Über die Funktion des Pankreas. L. Adler (*Arch. exp. Path. Pharm.*, 1921, **91,** 110-24).—Thyroid extract injected into hibernating hedgehogs causes an increase in metabolism. Their temperature rises and they wake up. Extract of the thymus and adrenaline have a similar action, but pancreatic extract has not. On the contrary, if pancreatic extract prepared from one hedgehog is injected into another hedgehog, the injection of thyroid extract into this second animal no longer has its customary action. Pancreatic extract similarly inhibits the action of thymus extract and of adrenaline.—J. H. B.

3930. Attempt to Detect Thyroid Secretion in Blood obtained from the Glands of Individuals with Exophthalmic Goitre and Similar Conditions. J. M. Rogoff and H. Goldblatt (*J. Pharm. Expt. Ther.*, 1921, **17,** 473-82).—No evidence by the "tapdole reaction" was obtained in any of the specimens of the presence of active thyroid secretion in the blood.—E. M.

3931. The Heart in Experimental Hyperthyroidism. H. Hashimoto (*Endocrin.*, 1921, **5,** 579-606).—Many investigators have been able to produce tachycardia, but hyaline degeneration appears to have been the severest lesion ever found in the myocardium of thyroid-fed animals. The writer found in a large percentage of thyroid-fed albino rats chronic non-suppurative interstitial myocarditis, the histology of which is fully entered into. The hearts showing such lesions are functionally inferior.—W. D. H. (*W. I.*).

3932. Thyroid Apparatus. IV. The Influence of Parathyroid and Thyroid Tissue on the Creatinine-Creatine Balance in Incubated Extracts of Muscle of the Albino Rat. F. S. Hammett (*J. Biol. Chem.*, 1921, **48,** 143-52).—The addition of parathyroid tissue to extracts of the muscle tissue of albino rats retards the increase of creatinine formation which takes place when such extracts are incubated. The retardation is greatest at the neutral point. Thyroid tissue has no such effect.—T. A. W.

3933. Action du corps thyroïde des glandes parathyroïdes sur les échanges respiratoires. M. Labbé and H. Stévenin (*Ann. de méd.*, 1921, **9,** 264-70).—Removal of the thyroid led to decrease of basal metabolism in rabbits and an increase of body weight. The conditions could be restored to normal by the administration of thyroid extract *per os.* Rémoval of the parathyroids produced a temporary increase in basal metabolism.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3934. Zur Altersanatomie der Kaninchenthymus. E. Gedda (*Upsala Läk. Fördh.*, 1921, **26,** Häft 5/6, Paper No. IX., pp. 27).—Details of the progress of involution in the thymus in 120 rabbits of various ages. The changes are not more marked in cortex than in medulla.—W. D. H.

3935. Morphology of the Thymus Gland and its Function. J. A. Hammar (*Endocrin.*, 1921, **5,** 543-72).—The thymus gland is a branchial cleft organ of epithelial nature, which becomes infiltrated with lymphocytes. In man the infiltration begins towards the end of the second month (embryonic length of 30 mm.); the formation of the medulla begins at about the length of 40 mm., and the first concentric corpuscles appear when the length reaches 50 mm. The epithelial elements are of different origin in various mammals—entodermal in some, ectodermal in some, and combined ento-ectodermal in others. The thymus is not a transitory organ, but persists and is active until old age. At puberty its parenchyma begins to be reduced; 5 types are described: those of childhood, puberal, youth, adult, and senescent. The thymus is never found to be normal in subjects who have died from disease; the parenchyma is generally reduced (accidental involution); far more infrequently it is increased. There is a certain normal lability with regard to the epithelial elements.—S. V.

3936. Die Wirkung intraarterieller Adrenalininjektion auf den arteriellen und venösen Blutdruck beim Menschen. O. Hess (*Arch. exp. Path. Pharm.*, 1921, **91,** 303-11).—Intra-arterial injections of adrenaline (*e.g.*, 0·2 c.c. 1:1,000) produce in man no considerable rise in general arterial pressure; the pulse almost disappears at the site of injection. The figures and curves in the paper are very convincing.—J. H. B.

3937. Über den Einfluss des Suprarenins auf das Wachstum der Kaulquappen. F. Bilski (*Pflüger's Arch.*, 1921, **191,** 108-27).—Growth was accelerated even by partially oxidised adrenaline.—C. L. E.

3938. Adrenaline Injections in Healthy People. A. Bjure and J. Svensson (*Upsala Läk. Fördh.*, 1921, **26,** Häft 5/6, Paper No. VI., pp. 36).—Intramuscular or subcutaneous injections cause a rise of blood-sugar (maximum 45 minutes later), and lymphocytosis (maximum 30 minutes) a rise of blood-pressure (30 minutes). The effect on red cells and Hb varies greatly; respiratory changes, glycosuria, changes in the blood NaCl were not observed. Even in the results most frequently seen people vary widely. —W. D. H.

3939. Die Adrenalinempfindlichkeit des menschlichen Organismus. K. Csépai (*Deutsch. med. Woch.*, 1921, **47,** 953-4).—The author presents evidence that variations in susceptibility to adrenaline merely depend on varying rates of absorption from the subcutaneous tissue where the drug is injected.—W. D. H.

3940. Blood-Pressure in Hypervagotonia caused by the Intravenous Injection of Adrenaline. J. J. Izquierdo (*Endocrin.*, 1921, **5,** 607-9).—The injection of 1 c.c. of adrenaline, 1:1,000 (1 mg.), caused a very marked fall of blood-pressure, which the author attributes to a reflex through the depressor nerve.—S. V.

3941. The Effect of Adrenaline upon Respiration. Ff. Roberts (*J. Physiol.*, 1921, **55,** 346-55).—The injection of adrenaline into an anæsthetised rabbit or cat leads to a cessation of respiration coincident with the rise of blood-pressure. By using Bayliss's device for maintaining a constant blood-pressure, it is shown that this is not caused by the rise of blood-pressure. A sudden fall of blood-pressure such as is caused by opening the abdominal aorta also causes cessation of respiration; clamping both carotid arteries, or both subclavian arteries below the origin of the vertebral arteries, has the same effect. It is claimed that the sudden anæmia of the medullary centres is a sufficient explanation of the effect of adrenaline on respiration.—J. H. B.

3942. The Reaction to Adrenaline administered by Rectum. R. G. Hoskins (*J. Pharm. Expt. Ther.*, 1921, **18,** 207-11).—Doses of 1 to 5 mg. administered to dogs and cats by rectum produced either no or little effects on blood-pressure or intestinal movements. (Conflicting results obtained by other observers may be due to a difference in strength of solution injected; the concentration of injection does not seem to be mentioned in these experiments.)—J. A. G.

3943. Adrenaline Hyperglycæmia—II. A. L. Tatum (*J. Pharm. Expt. Ther.*, 1921 **18,** 121-31).—As measured by the hyperglycæmia, the glycogenolytic action—like the pressor action—of adrenaline is transient, and occurs *pari passu* with the inflow of the drug, whether from subcutaneous or intravenous injection. There is no more evidence that the glycogenolytic action is due to the adrenaline being altered after absorption than there is that its pressor action is due to altered adrenaline.—J. A. G.

3944. Die Behandlung der Rachitis mit Adrenalin. F. Lehnerdt and M. Weinberg (*Münch. med. Woch.*, 1921, **68,** 1482-4).—Thirty severe cases of rickets (children 1 to 3 years) were given adrenaline by the mouth. This was administered for 4 to 6 weeks in doses of "0·2 suprarenin, hydrochloric Höchst 0·1, rising to about 0·5%," 3 or 4 times daily. In addition $CaCO_3$ was given 3 times daily. Of the 30 cases, 21 were considerably improved or cured.—J. H. B.

3945. The Preservation of Adrenaline. F. Richard and M. Malmy (*J. pharm. chim.*, 1921, [7] **23,** 209-14).—Solutions made by the aid of SO_2 with physiological salt solution are best; the SO_2 acts as solvent and preservative. It may be preserved in ampoules filled with great care in an atmosphere of CO_2. Such ampoules have kept perfectly for a year.—W. D. H. (*Chem. Abstr.*).

3946. On the Pituitary Active Principles and Histamine. H. H. Dale and H. W. Dudley (*J. Pharm. Expt. Ther.*, 1921, **18,** 27-42).—Abel and his co-workers have now abandoned the view that histamine is the main oxytocic principle of pituitary extract, but still think that it may appear during the hydrolytic destruction of that principle. The present authors show, however, (1) that histamine is not present, even in a commercial infundibular extract, in sufficient concentration to complicate the recognition and evaluation of the specific oxytocic principle; (2) that there is no satisfactory evidence of the presence of more than traces, if any, of histamine from the hydrolysis of pituitary extract; and (3) that there is therefore no reason at present for suggesting a relation between histamine and the specific action of the extract. They find further that the specific pressor and oxytocic actions of pituitary extract are destroyed by boiling with

0·5% HCl, but are not affected by papain, and that the specific oxytocic principle is slowly destroyed by erepsin. These results, though from one point of view partly negative, constitute an important step towards the solution of this interesting problem. —J. A. G.

3947. On the Relative Amounts of Depressor and Broncho-Constrictor Substance Obtainable from the Anterior and Posterior Lobes of the Fresh Pituitary Gland. J. Roca (*J. Pharm. Expt. Ther.*, 1921, **18,** 1-25).—Simple aqueous extracts of the posterior and anterior lobes of the pituitary, prepared in such a way as to abolish their blood-pressure raising properties and to preclude all chance of bacterial activity, possess blood-pressure lowering and broncho-constrictor properties, the activity of the extract of the posterior lobe being to that of the anterior lobe as about 8:1. A chloroform extract of dried sterile pituitary gland yields a small amount of a substance which acts like histamine on arterial pressure, uterus, and bronchi, and which is considered to be actually histamine itself. The posterior lobe yields to chloroform about 20 times as much of this substance as does the anterior lobe, weight for weight of fresh material.—J. A. G.

3948. Absence of the Pars Buccalis of the Hypophysis in a 40-mm. Pig. E. Holt (*Anat. Rec.*, 1921, **22,** No. 3).—In this rare anomaly the pars neuralis was well developed, and normal in position and structure. It would tend to disprove the theory which attributes the development of the infundibular process to the pressure of Rathke's pocket on the anterior brain vesicle.—W. D. H. (*W. I.*).

3949. Cytology of the Internal Secretory Functions of the Human Placenta and Decidua. G. Fujimura (*J. Morph.*, 1921, **35,** 485-580).—A lengthy histological description of various types of cell, with plates. They contain in different degrees rod-shaped "platosomes," lipoid granules, and vacuoles (liquefied lipoid). The changes they undergo at various dates are taken as due to their endocrine functions, some secretions passing to the mother's body, others to the fœtus. The changes in the cells prior to and accompanying menstruation are of the same nature.—W. D. H.

3950. Cytology of the Pineal Body of the Sheep. H. E. Jordan (*Anat. Rec.*, 1921, **22,** No. 4).—The "interneuroglia cells" are characterised by small spherical mitochondria and a variable number of larger lipoid globules. There is a reciprocal relationship between the mitochondria and the lipoid droplets. Whether there is also in fact a genetic relationship remains undetermined. The lipoid globules constitute the only evidence indicative of secretory activity. The cells apparently lack a centrosome, and divide only amitotically at this period. Certain transformations in the lipoid droplets produce appearances simulating a Golgi net and trophospongium.—W. D. H. (*W. I.*)

REPRODUCTIVE SYSTEM

3951. Zur Beurteilung der Steinach's Verjungungsoperation. K. Mendel (*Deutsch. med. Woch.*, 1921, **47,** 986-9).—A polemical discussion of Steinach's views and work. His so-called puberty gland is a hypothetical structure. Rejuvenation was expected from thyroid treatment, and will continue to be awaited from other operations.—W. D. H.

3952. Reptilian Spermatogenesis. I. Lizards. T. S. Painter (*J. Exp. Zool.*, 1921, **34,** No. 3).—In Iguanidæ (7 species) there were 12 large γ-shaped chromosomes and a number of dots which varies characteristically in the different species. An X chromosome of the "double odd" type (from 2 spermatogonia) was found. No double "reduction" of chromosomes occurs.—W. D. H. (*W. I.*).

3953. Die freie Hodentransplantation beim Menschen. R. Lichtenstern (*Zeit. f. urol. Chirurg.*, 1921, **6,** 305-13).—Directions for the successful transplanting of testis tissue in man.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3954. Coagulation Factors in Uterine Mucosa. Jessie L. King (*Amer. J. Physiol.*, 1921, **57,** 444-53).—Menstrual blood is usually stated to be non-coagulable, though various views are held as to the cause. The juice expressed from the mucous membrane of the non-pregnant uterus of the pig frequently yields antithrombin; the pregnant organ seldom yields it. Howell and Holt's heparin was suspected in both conditions. The results are so irregular that masking by excess of thromboplastin is assumed. If the anticoagulating substances are present in the human subject, they might prevent coagulation in menstrual blood. Neither fibrinogen, thrombin, nor antithrombin were demonstrable in this blood, so the blood may have already clotted, and the discharge consist of serum and small bits of clot. Antithrombin and antiprothrombin are obtainable from pigs' intestinal mucosa.—W. D. H.

3955. Sur l'évolution de l'ovaire adulte de la lapine. A. L. Salazar (*Compt. rend. soc. biol.*, 1921, **85,** 783-4).—The adult ovary of the rabbit is classified into four different types. It is suggested that cyclical changes may occur in the organ.—J. H. B.

3956. The Ovaries of the King Salmon during the Spawning Migration. C. W. Greene (*J. Biol. Chem.*, 1921, **48,** 59-71).—The ovaries increase in weight 400 to 500% during the spawning period; 90 to 95% of the total weight of the mature ovaries is acquired when the salmon is in fresh water and not feeding. The gonads grow at the expense of the other tissues. The composition of the mature ova is as follows: Water 58, total solids 42, protein 26, phospho-lipins 1, neutral fats 10, total organic extractives 1·4, ash 0·6%. The salts, proteins, organic extractives do not show much change as the ovaries develop. The neutral fats show the most change, and are highest in the young ovaries. They are the principal source of energy. The phospho-lipins also decrease in amount as the ovaries mature. The bearing of these observations is discussed and compared with development of the hen's egg.—T. A. W.

3957. Green Exudate on Pregnant Uterus. H. Briggs (*Proc. Roy. Soc. Med.*, 1921, **15,** Sect. of Obstr., 1-2).—A case of Cæsarean section, with no special interest except for this exudate, the nature of which was undetermined except that tests for bile and blood-pigment were negative.—W. D. H.

3958. Weight, Sitting Height, Foot Length, and Menstrual Age of the Human Embryo. G. L. Streeter (Carnegie Inst., Washington, publication 274, 143-70; contrib. to *Embryol.*, No. 55).—Such a paper must be consulted in the original by embryologists and statisticians interested. The summary occupies 7 quarto pages, and the tables of data 10.—W. D. H.

3959. Behaviour of Trypan Blue injected into the Developing Hen's Egg. G. B. Wislocki (*Anat. Rec.*, 1921, **22,** No. 4).—The small opening in the shell (eleventh day of incubation) was sealed, and the egg returned to the incubator. Two days later the embryo was examined. The dye passed into the air-chamber, yolk-sac, allantoic sac, amniotic sac, and into the mesoderm of the allantois. It is absorbed rapidly by the shell membrane enclosing the air-chamber. From the yolk-sac it escapes through the endodermal cells lining the sac into the subepithelial mesoderm, where it is taken up and stored by mononuclear cells which surround the vitelline vessels. In the allantoic sac the dye fails to be absorbed. In the amniotic sac it stains the amniotic epithelium, and also enters the fœtal gastro-intestinal tract through the mouth. In the mesoderm of the fœtal membrane it diffuses into the blood-stream, and vital staining of the embryo results.—W. D. H. (*W. I.*).

3960. Composition de l'œuf de grenouille rousse (Rana fusca) à l'époque de la ponte. E. F. Terroine and H. Barthélémy (*Compt. rend.*, 1921, **173,** 611-13).—Experiments were carried out on eggs removed from the ovary in the last week of February and the first week in March, laying having taken place in the laboratory controls during the first days of March. The following determinations were made: Water by drying, total

N (Kjeldahl), fats, lipoids, and cholesterol by the methods of Kumagawa-Suto and Windaus. The authors conclude from the results that (1) the composition of the eggs is remarkably constant, being independent of the age, weight, etc., of the individual producers; (2) the organic material is almost entirely composed of nitrogenous substances, fats, and lipoids; (3) the composition of the frog's egg is remarkably similar to that of other species such as the trout and silkworm.—Ha. W.

3961. Composition chimique de l'œuf et du têtard de Rana temporaria. F. Frémiet and Mlle. du V. de Streel (*Compt. rend.*, 1921, **173,** 613-6).—Analyses have been made of the mature egg, the tadpole at the time of hatching, and at the limit of fasting growth. It is found that between the 1st and 2nd and 2nd and 3rd stages there is a gain in total weight, but a loss in dry weight resulting from the respiratory combustion. The loss is chiefly in glycogen and lipoids. The " vitelline " can be considered as a reserve of nitrogen, sulphur, and phosphorus progressively hydrated and transformed into organised substance in the course of growth. It is concluded that the development of the tadpole without external nutritive material cannot be considered as a simple increase in weight by imbibition of water, but as a true growth of which the essential character is " autotrophic."—Ha. W.

3962. De l'existence de rapports biométriques entre la grenouille rousse (Rana fusca) et ses œufs à l'époque de la ponte. E. F. Terroine and H. Barthélémy (*Compt. rend.*, 1921, **173,** 740-2).—The composition of the eggs of this frog is independent of the physiological condition of the female producing them. Further experiments have been undertaken to determine whether there is any relation between the mass of eggs produced and the quantity of them, and between the weight of the frog and the total fat in the body. The results show that at the time of laying the weight of the eggs represents 15% of the total weight of the body; and the quantity of fat and lipoid in the eggs represents 68% of the total content of the organism in these materials.—Ha. W.

3963. Pharmakologische Studien über Barben und Hechtrogen. F. H. McCrudden (*Arch. exp. Path. Pharm.*, 1921, **91,** 46-80).—The roe of the pike contains a poisonous substance, soluble in distilled water, which will not dialyse. It is precipitated by lead acetate, by saturation with $(NH_4)_2SO_4$, by colloidal iron, and is destroyed by heating to 100° C. It is not a crystalline compound like tetradonin, but is apparently a protein, though not a globulin or protamine. It may be an albumin or a substance only separated with great difficulty from protein. It is only a strong poison when injected directly into the blood-stream, and its effect is chiefly on the C.N.S.; it paralyses the respiratory centre. It is without a curare action, does not affect coagulation, or cause hæmolysis. The poisonous substance in the roe of the barbel has similar chemical and pharmacological properties.—J. H. B.

3964. Eihüllenbildung der Vögel sowie Entstehung der Färbung der Vogeleier. H. Giersberg (*Biol. Zentralbl.*, 1921, **41,** 252-68).—An account of the formation of the white, the egg membrane, and the shell of the bird's egg. The pigment is said to arise from the decomposition products of hæmoglobin liberated by the breaking down of erythrocytes.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3965. Modifications des glandes génitales accessoires du cobaye après la castration. E. Gley et A. Pézard (*Arch. intern. de physiol.*, 1921, **16,** 464-73).—La castration entraîne chez le jeune cobaye une atrophie des vésicules séminales ou *glandes vésiculaires* et des glandes prostatiques: altération de l'épithélium des glandes vésiculaires. Le liquide qu'elles secrétent est fluide et a perdu la propriété de se coaguler au contact du liquide prostatique.—L. F.

MILK

3966. Sur la présence des pentoses dans le lait. O. Laxa (*Lait*, 1921, **1,** 118-21).—The pentoses are derived partly from the food and partly from vegetable impurities.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

3967. Goat's Milk. J. K. Calvin (*Arch. Pediatrics*, 1921, **38,** 584-91).—A plea for the more extensive use of the milk of the " poor man's " cow. Goats are immune to tuberculosis. It is highly antiscorbutic. Particulars regarding composition are quoted from others.—W. D. H.

3968. Can " Home-Grown Rations " supply Proteins of Adequate Quality and Quantity for High Milk Production? E. B. Hart, G. C. Humphrey, and J. H. Jones (*J. Biol. Chem.*, 1921, **48,** 305-11).—This is possible with a ration composed of either barley or corn (maize) supplemented with corn silage and alfalfa hay.—J. C. D.

PHARMACOLOGY

3969. Zur Kenntnis der Gewöhnung—V. J. Biberfeld (*Biochem. Zeit.*, 1921, **122,** 260-8).—Attempts were made to break the tolerance of dogs to successive doses of morphine. Withdrawals of blood or subcutaneous administration of protein (milk) effected a temporary break. Injections of acid or alkali were without effect.—H. K.

3970. Oxygen Therapy. I. In Cardiac Insufficiency. II. In Pneumonia. III. In an Extreme Type of Shallow Breathing occurring in Lethargic Encephalitis. A. L. Barach and M. N. Woodwell (*Arch. Int. Med.*, 1921, **28,** 367-425).—These 3 papers contain valuable indications of the benefit to be derived from oxygen administration in the conditions specified. I. A simple form of rebreathing apparatus is described which affords a minimum of inconvenience to the patient. In 7 cases of cardiac insufficiency oxygen administration raised the arterial and venous saturation. The time necessary to accomplish this appeared to depend on the extent of œdema in the lungs. The relief of cyanosis and some slowing of the pulse were the chief features of the administration. Cardiac dyspnœa was not relieved, and the authors suggest that this phenomenon is caused, not by O_2 want, but by difficulty in eliminating CO_2. Except that breathing ceased to be periodic under oxygen, it was not affected appreciably. The slowing of the pulse obtained in these cases was not such as to indicate that oxygen administration was a valuable therapeutic measure. II. 12 cases of pneumonia were studied, the beneficial effects being precisely similar to those obtained in cardiac insufficiency. In cases, however, in which acute oxygen want followed the development of pulmonary œdema, prolonged O_2 administration resulted in a striking clinical improvement, and probably averted death. III. 2 patients with encephalitis lethargica who had developed an extreme type of shallow breathing, and who were in coma, greatly benefited from oxygen administration. This did not assist in CO_2 elimination, and in one case heart failure ensued apparently in relation to CO_2 retention.—J. H. B.

3971. Über den Antagonismus der Lokalanästhetika gegenüber dem Veratrineffekt am Muskel. J. Schüller and F. Athmer (*Arch. exp. Path. Pharm.*, 1921, **91,** 124-9).—The veratrine effect on striped muscle is abolished by substances having a local anæsthetic action, such as cocaine and novocaine. Thus a muscle veratrinised by immersion in a 0·001% solution gives normal responses again after 5 minutes in 0·2% novocaine. If the muscle is then repeatedly washed, the veratrine effect returns. The veratrine response of a curarised muscle is also abolished by cocaine.—J. H. B.

3972. Contribution à l'étude et à la thérapeutique experimentales du coup de chaleur. C. Richet, Jun. (*Compt. rend. soc. biol.*, 1921, **85**, 713-4).—Mice and rats exposed to sunlight under glass vessels die from heat stroke. They are killed by heat, and not by light. Newly-born mice resist less than fully-grown ones, and these in turn less than adolescent animals. Fasting animals, or animals after bleeding, have lower resistance than normal animals. Caffeine and camphorated oil have the power of prolonging life.—J. H. B.

3973. The Relation of the Dextrose and Water Content of the Blood to Antipyretic Drugs. H. G. Barbour and J. B. Herrmann (*J. Pharm. Expt. Ther.*, 1921, **18**, 165-83).—Sodium salicylate, acetyl salicylic acid, antipyrine, and quinine all increase, though to different extents, the blood-sugar concentration in both normal and febrile dogs. They produce a notable dilution of the abnormally concentrated blood occurring in fevers, and this dilution accounts for the decrease in body temperature. The dilution is due chiefly to the rise in dextrose concentration.—J. A. G.

3974. Action de la saponine sur les plaquettes et sur leur régénération. J. Firket (*Compt. rend. soc. belge biol.*, 1921, 730-2).—Une métaplasie myéloïde, à type mégacaryocytaire, apparaît dans la rate et le foie. Les mégacaryocytes paraisent répondre aux pertes sanguines les plus sérieuses, car la saponine présente sur les plaquettes une action lytique plus énergique encore que son action hémolytique bien connue.—E. Z.

3975. Effets de l'arsenic sur le développement des os. A. van den Eeckhout (*Compt. rend. soc. belge biol.*, 1921, 740-1).—Selon l'auteur, chez les lapins parfaitement bien nourris, l'arsenic, administré à petites doses, influence très peu l'état d'embonpoint, le développement corporel et la taille des individus. Dans ces conditions, l'arsenic exerce une action manifeste et constante sur les phénomènes d'ossification, en se sens qu'il modifie la structure intime des os de façon à les rendre plus denses, plus lourds et plus résistants.—E. Z.

3976. Die Reduktion der aromatischen Nitrogruppe als Indikator von Teilvorgängen der Atmung und der Gärung. Eine Methode zur vergleichend-quantitativen Bestimmung biologischer Oxydo-Reduktionen. I. Versuche an atmenden Zellen. II. Versuche an gärenden Zellen. W. Lipschitz and A. Gottschalk (*Pflüger's Arch.*, 1921, **191**, 1, 32-50).—I. The *m*-nitrophenyl hydroxylamine produced by the reducing action of tissues on *m*-nitrobenzene (Abstracts Nos. 2053 and 3643, Vol. V., pp. 327, 576) can be estimated colorimetrically after filtration, and a quantitative measure of hydrogen activation thus obtained. Experiments on frog muscle show that the reduction rate depends on the concentration of co-ferment in the sense in which that term was used by Meyerhof; the falling-off of the reduction rate with time resembles that of the oxygen respiration rate. Reduction is destroyed by temperatures over 80° C., is dependent on intact cell structure, is diminished with increase of oxygen pressure and by narcotics. While combinations of narcotics have an additive effect on the reduction, a combination of a narcotic with HCN always shows less inhibition than the sum of the effects of the 2 substances separately, and not infrequently less than one alone. The curve relating inhibition to reduction of concentration of HCN is, unlike the O_2 respiration curve, a diphasic one, with maximum at 0·05% and a new minimum at 0·5% KCN (neutralised). Reduction is lost after extraction of the muscle with water, but is restored again by muscle or yeast juice, or by succinic, fumaric, citric, glutamic, and *a*-glycerophosphoric acids; after partial extraction it is restored to some extent by lactic acid, but never by maleic, glutaric, pyruvic, oxybutyric, or tartaric acid, or by glycerol, glyceric acid, dextrose, levulose, or glycogen. In unextracted muscle reduction is accelerated by succinic and fumaric acids, but inhibited by maleic acid, also by saponin. (The authors were unacquainted with Hopkins's work, which clearly explains many of their results.) II. The musculatures of *Ascaris* and *Lumbricus* were studied as examples of facultative

anaerobic tissues. *Ascaris* reduced powerfully; the reduction was independent of intact cell structure, was thermolabile, dependent on presence of co-ferment, not inhibited by oxygen, and never inhibited more than 30% by HCN, the curve being also not diphasic. *Lumbricus* reduced less powerfully, the reduction being dependent on intact cell structure, and being inhibited up to 80% by HCN (uniphasic). The reduction by *B. proteus* and *butyricus* is also (incompletely) inhibited by KCN (0·25%).—C. L. E.

3977. Erhaltung der Funktionen aerober Zellen bei Ersatz des freien Sauerstoffs durch chemisch gebundenen: "Pseudoanoxybiose." III. Versuche an Spermatozoen. W. Lipschitz and G. Hertwig (*Pflüger's Arch.*, 1921, **191,** 51-9).—Frog's spermatozoa exposed to oxygen for 1 to 3 hours lose their motility and reducing power, and die. If kept in hydrogen they lose their motility in about 1 hour, but if a hydrogen acceptor (dinitrobenzene) is added movement is restored. HCN also immobilises them, but does not completely remove their reducing power. Fumaric acid is much less toxic than maleic acid to spermatozoa, though salts of either acid are not toxic to the frog heart.—C. L. E.

3978. The Physiological Action of N-Methylhistamine and of Tetrahydropyrido-3-4-iminazol ("Imidazolisopiperidin" of Fränkel). H. H. Dale and H. W. Dudley (*J. Pharm. Expt. Ther.*, 1921, **18,** 103-10).—N-methylhistamine has $\frac{1}{200}$ of the activity of histamine on the blood-pressure, and about $\frac{1}{80}$ of the activity on the uterus. Tetrah. (contrary to the statements of Fränkel and Zeimer) has only $\frac{1}{1500}$ of the activity of histamine on the uterine muscle, and practically no action on the blood-pressure. This paper is a further contribution to the study of the problem of the relation, if any, existing between the active principles of pituitary and histamine, or a derivative of it. —J. A. G.

3979. Über lokalanästhetische Wirksamkeit bei Antipyreticis, Opiumalkaloiden und Salzen. H. Rhode (*Arch. exp. Path. Pharm.*, 1921, **91,** 173-217).—The various antipyretics have the property of relieving pain. To what is this action due ? It may be that they have a specific effect on nerve endings, and, if so, their pain-relieving power should run parallel to their local anæsthetic effect. To determine this the author has undertaken a quantitative investigation of the relative local anæsthetic power of a large number of substances. The skin of the forearm is the "test object." He compares antipyretics, opium alkaloids, salts, quinine, urethane, etc. The conclusion is that the local anæsthetic properties do not run parallel to the power to relieve pain. —J. H. B.

3980. Effects of Morphine and Alkaloids of the Benzylisoquinoline Group on Cardiac Muscle. P. J. Hanzlik (*J. Pharm. Expt. Ther.*, 1921, **17,** 445-72).—There does not appear to be such a definite relation between clinical structure and pharmacological action in the case of alkaloids of the benzylisoquinoline and of the pyridine-phenanthrene groups acting on the perfused amphibian heart, as has been described in their action on smooth muscle. Thus papaverine, chelidonine, and narcotine depressed the tone, rate, and amplitude of the contractions of the perfused heart, while other members of the benzylisoquinoline group, such as cotarnine and hydrastinine, acted more like morphine (pyridine-phenanthrene group).—E. M.

3981. Zur Opiumwirkung auf den Magen. L. Jarno and D. Marke (*Wien. klin. Woch.*, 1921, **34,** 498-9).—The evacuation-time of the stomach (observed with Röntgen rays) is lengthened under the influence of opium; this is independent of the acidity (closing of the pylorus). Higher acidity is caused by the food remaining longer in the stomach and by the inhibition of the regurgitation of duodenal juice.—H. W.

3982. Influence of Phenyl Cinchoninic Acid and the Ethyl Ester of Paramethylphenyl Cinchoninic Acid on Renal Excretion. V. C. Myers and J. A. Killian (*J. Pharm. Expt. Ther.*, 1921, **18,** 213-20).—Both substances, by an action on the kidney, increase the

excretion of uric acid, as well as of urea and chlorides, when the latter are in high concentration in the blood.—J. A. G.

3983. Die Verteilung der Chinaalkaloide im Organismus—II. A. Schnabel (*Biochem. Zeit.*, 1921, **122,** 285-94).—Further experiments with kidney and brain emulsions and optochin show the same behaviour as earlier experiments with corpuscles (Abstract No. 3158, Vol. V., p. 502). The optochin is taken up by the cells and slowly given up to the surrounding fluid. Parallel with this behaviour *in vitro* it is found that freshly defibrinated blood of a rabbit injected with optochin has a lower concentration of optochin in the serum when examined immediately than when kept for some time. The fixation of optochin by corpuscles is an adsorption phenomenon. Quinine, which can also be estimated by its inhibitory action on the reducing capacity of pneumococci to methylene blue, is likewise taken up by the corpuscles and slowly given off to the surrounding fluid, producing an actual increased concentration of quinine in it.—H. K.

3984. Route of Administration of Drugs and Toxicity, with Special Reference to Ethylhydrocuprein Hydrochloride. J. A. Kolmer (*J. Pharm. Expt. Ther.*, 1921, **17,** 431-44).—The relative toxicity of various drugs, including ethylhydrocuprein hydrochloride, mercurophen, arsphenamine, and neoarsphenamine, according as to whether they are injected intrapleurally, intraperitoneally, intravenously, or subcutaneously into mice, rats, guinea-pigs, and rabbits is described. In general a compound is about 8 times more toxic by subthecal than by intravenous injection; 0·6 to 0·7 times more toxic by intrapleural, 1 to 4 times less toxic by intraperitoneal, and 2 to 16 times less toxic by subcutaneous than by intravenous injections. Differences from this generalisation are, however, apparent according to drug, method of administration, and type of animal employed.—E. M.

3985. Über die Wirkung des Pilocarpins auf den Glykogengehalt der Organe. C. Hornemann (*Biochem. Zeit.*, 1921, **122,** 269-73).—The hyperglycæmia produced by pilocarpine (Bornstein and Vogel, Abstract No. 2701, Vol. VI., p. 389) was not influenced by administration of oxygen through the vena femoralis. The glycogen of the liver is used up in pilocarpine glycæmia, but that of the muscles shows but a slight decrease. —H. K.

3986. Action du gardénal sur les manifestations leucocytaires de l'hémoclasie digestive chez les épileptiques. D. Santenoise and J. Tinel (*Compt. rend. soc. biol.*, 1921, **85,** 844-6).—Epileptics and various other classes of mental patients show a marked "digestive hæmoclasis"—*i.e.*, sensitiveness to certain foods resulting in a degree of shock when the foods are eaten. Treatment of epileptics by "gardénal" suppresses the "digestive hæmoclasis"—*i.e.*, the typical variations in the leucocyte count which occur in the shock are absent. "Gardénal" also abolishes the slowing of the pulse consequent on ocular compression.—J. H. B.

3987. Action des extraits de rein sur le pneumogastrique. H. Roger (*Compt. rend. soc. biol.*, 1921, **85,** 710-1).—If minced kidney is mixed with $1\frac{1}{2}$ times its weight of water, acidified, heated to 120° for 100 hours, filtered, neutralised by baryta, treated with $HgCl_2$ (excess Hg removed with H_2S), an extract is obtained which is concentrated and precipitated by alcohol. When this is again dissolved in water and injected into dogs or rabbits intravenously, a vagus effect abolished by atropine is obtained.—J. H. B.

3988. Action of Salts on Liver. M. Einhorn (*New York Med. J.*, 1921, **114,** 262-72).—An extension with clinical experience of work previously published (Abstract No. 904, Vol. VI., p. 138); the salt chiefly dealt with is $MgSO_4$. In jaundice this salt given into the duodenum may cause the appearance of bile in the gut if the occlusion of the duct is not complete; this aids diagnosis.—W. D. H.

3989. Effects of Vasomotor Depressants upon the Volume of the Liver. C. W. Edmunds (*J. Pharm. Expt. Ther.*, 1921, **18,** 155-63).—The nitrite group of vasomotor

depressants lowers the portal blood-pressure and decreases the volume of the liver. These effects are secondary to the changes produced in the general systemic blood-pressure. The blood tends to accumulate, therefore, in abdominal organs other than the liver, in contrast to what occurs in anaphylactic shock in dogs.—J. A. G.

3990. The Activity of the Isolated Uterus. S. Ogata (*J. Pharm. Expt. Ther.*, 1921, **18,** 185-200).—Observations on the movements of the isolated uterine muscle (circular and longitudinal, denervated and intact) of rabbits, guinea-pigs, and rats. An unexpected result is that, after administration of atropine, adrenaline always produces a temporary inhibition in the virgin rabbit's uterus. "The action of atropine therefore appears to resemble the final action of ergotoxine in the uterus, in that it paralyses the motor endings of the sympathetic."—J. A. G.

3991. Response to Drugs of Excised Bronchi from Normal and Diseased Animals. D. I. Macht and G. C. Ting (*J. Pharm. Expt. Ther.*, 1921, **18,** 111-9).—Using isolated rings of bronchi from normal and diseased pigs, the authors find that such preparations obtained even in a very fresh condition from pathological lungs respond to the action of drugs much less readily than do rings of normal bronchus. They state that no attention, so far as they are aware, has been paid to the behaviour *in vitro* of freshly excised tissues from organs more or less diseased, but this kind of inquiry has already been attempted by Gunn and Whitelocke (*Brit. J. Surg.*, 1914, p. 92), who found, in the case of the excised human appendix, that "retention of the power of executing spontaneous rhythmic contraction is not incompatible with the presence of very severe inflammation."—J. A. G.

3992. Pharmacology of Chelidonin. P. J. Hanzlik (*J. Pharm. Expt. Ther.*, 1921, **18,** 63-102).—A survey of the physical and chemical properties and pharmacological actions of chelidonin (an alkaloid from the celandine), with a view to suggesting that it may prove to be a cheaper and possibly superior substitute for the closely related alkaloid papaverine for the therapeutic purpose of depressing smooth muscle.—J. A. G.

3993. Subconjunctival Injections of Salt Solution. I. Mukai (*Nippon Gankwagakkai Zasshi*, 1918, **22,** 300-13; *Jap. Med. Lit.*, 1921, **6,** 12).—These injections produced an increase in the protein content of the aqueous fluid (humor ?). A 2% solution produced the greatest increase, followed, in descending order, by distilled water, 0·2%, 0·4%, and 1% solutions.—W. D. H. (*Chem. Abstr.*).

3994. Zur Pharmakologie der Gefässe—I. L. Adler (*Arch. exp. Path. Pharm.*, 1921, **91,** 81-109).—Experiments on the results of perfusing with fluids containing different drugs the pulmonary artery and the great cutaneous artery of the frog (R. esc.). Both arteries react similarly. Large doses of adrenaline, histamine, tyramine, phenyl ethylamine, hordenine, and pituitary extract cause contraction. Peptone, papaverine, and narcotine cause dilatation. HCl, lactic acid, and CO_2 cause dilatation in low concentration, but constriction in higher strengths. The concentration in which HCl causes optimal vaso-dilatation is the same ($\frac{1}{1000}$) as that in which it stimulates the respiratory centre.—J. H. B.

3995. Effect of Subcutaneous Injections of Potassium Cyanide on Blood-Catalase. W. H. Welker and J. L. Bollman (*J. Biol. Chem.*, 1921, **48,** 445-51).—Even lethal doses have no effect; this renders Geppert's theory untenable.—W. D. H.

3996. Sensitiveness of Sensory and Motor Fibres to Drugs. Y. Ozaki (*Kyoto Igaku Zasshi*, 1918, **15,** 27-71; *Jap. Med. Lit.*, 1921, **6,** 1-2).—The isolated sciatic nerve of the frog was used. The sensory fibres were paralysed more rapidly than the motor fibres by distilled water, a hypertonic solution of glucose in Ringer solution, and solutions of neutral salts. KCl and $MgCl_2$ paralysed the sensory endings almost immediately. Acids and alkalis influenced both types to about the same extent. Anæsthetics (EtOH, urethan, chloral hydrate) and antipyretics (acetanilide, antipyrine) acted slightly more

rapidly on the sensory fibres. Cocaine acted more rapidly on the sensory fibres. While the action of strychnine HNO_3, atropine H_2SO_4, and apomorphine HCl was slow, it was more rapid in the case of the sensory fibres. Tetrodotoxin and veratrine HCl acted rapidly, and their action was more powerful on the sensory fibres; PhOH acted far more powerfully on these fibres. Aconitine acted rapidly, and approximately equally on both types. Curare and guanidine HCl, morphine, pilocarpine, and heroine HCl had no effect on either type.—W. D. H. (*Chem. Abstr.*).

3997. The Adsorptive Power of Serum and Brain Substance for Cocaine. L. Eerland and W. S. v. Leeuwen (*Proc. Acad. Sci. Amsterdam*, 1920, **22,** 831-49).—The action of cocaine on the muscle-nerve preparation (frog) was considerably inhibited by the addition to its solution of the serum of man, dog, rabbit, and guinea-pig; the brain substance of the rabbit and cat; the ether extract of dried cat's brains or lecithin. This inhibition was due to its physical adsorption; for when a mixture with reduced cocaine activity was extracted with alcohol and HCl, all the cocaine was recovered and had retained its activity. Serum, brain substance, and lecithin in themselves were without action on the nerve; and this also held true of the extractives obtained from these substances by treatment with alcohol and HCl.—W. D. H. (*Chem. Abstr.*).

3998. Über Digitalis. G. Joachimoglu (*Arch. exp. Path. Pharm.*, 1921, **91,** 156-69).—A tincture of digitalis of high activity was kept under different conditions during one year. It was then re-examined. A sample kept in a cellar in which the temperature never rose above 18° C. had not deteriorated at all. Samples kept at room temperature and at 37° had lost about $\frac{1}{3}$ of the activity. Samples to which $NaHCO_3$ was added lost nearly $\frac{3}{4}$ of activity.—J. H. B.

3999. Die treibenden Kräfte für den Flussigkeitsstrom im Organismus. II. Quellungsdruck der Eiweisskörper und Diurese. Zur Wirkungsweise des Coffeins als Diuretikum. A. Ellinger, P. Heymann, and G. Klein (*Arch. exp. Path. Pharm.*, 1921, **91,** 1-36).—A complete account of experiments previously published (see Abstract No. 409, Vol. VI., p. 62) describing the action of caffeine as a diuretic. It does not act by stimulating the renal cells, but by causing a fall in the " Quellungsdruck " of the serum proteins for water. The serum proteins under the influence of caffeine exert a smaller force of imbibition on water, and more passes through the glomerular membrane.—J. H. B.

4000. Un nouveau groupe de diurétiques: les diurétiques interstitiels. La diurèse par déplacement d'ions. L. Blum (*Compt. rend.*, 1921, **173,** 744-6).—The treatment of œdema which consists in the association of a diet poor in salt and water with cardiac or renal medication, is ineffectual when the retention of water does not arise from cardiac or renal affections. In such cases the administration of strong doses of K or Ca salts, associated with a salt-free diet, was efficacious. This treatment has caused a rapid reduction of œdema of unknown origin, pleural and ascitic effusions, and exceptionally cardiac œdemas rebellious to digitalis. It is necessary that the diet should be poor in Na if the diuretic action of the K and Ca salts is to be obtained. The dose is important; 3 to 4 gm. of these salts fail, 15 to 25 gm. act powerfully. Dropsical fluids are essentially solutions of NaCl, and it is admitted that the retention of salt causes the retention of water; it is the Na-ion which regulates the hydration; K and Ca displace the Na from dropsical fluids. The Na is excreted in the urine, carrying with it excess of water.—Ha. W.

TOXICOLOGY

4001. Ionengleichgewicht und Giftwirkung. S. G. Zondek (*Deutsch. med. Woch.*, 1921, **47,** 855-7).—A lecture treating the subject generally. Destruction of the ionic balance causes toxic effects; this is a conclusion which none can dispute. He further

says a Ringer's solution with high Ca content can replace Bayliss's gum-saline; this may not be accepted so readily (compare Abstract No. 3405, Vol. VI., p. 500).—W. D. H.

4002. Ricerche farmacologiche sul ferro. IV. Azione comparata dei sali ferrosi e ferrici. L. Sabbatani (*Arch. di Fisiol.*, 1921, **19,** 197-210; compare Abstracts No. 3117, Vol. VI., p. 454; and Nos. 882 and 2148, Vol. IV., pp. 144 and 343).—The different initial actions of ferrous and ferric salts is to be referred to the kations $Fe^{\cdot\cdot}$ and $Fe^{\cdots}$. The immediate toxicity of ferrous preparations is small as compared to that of ferric salts. In the organism ferric salts rapidly undergo chemical and physical changes, and thus lose their toxicity. Ferrous salts likewise undergo slow changes, but these are not yet understood; they may consequently produce chronic poisoning, which is not found with ferric salts. In course of time both classes of salts are tenaciously fixed by the tissues, in which they form insoluble deposits which are reabsorbed with extreme slowness. The iron thus fixed probably adapts itself to the chemical conditions of its surroundings, and always results eventually in the same chemical products. Ferrous salts are, on the whole, less toxic than ferric, which justifies their more frequent therapeutic employment.—C. d. F.

4003. Toxic Effects of Chlorine Antiseptics in Dogs. H. G. Barbour and A. M. Hjort (*J. Pharm. Expt. Ther.*, 1921, **18,** 201-6).—Given intraperitoneally in dogs, chloramine-T appears to possess 1 or $1\frac{1}{2}$ times the toxicity of Dakin's solution, and but $\frac{1}{5}$ the toxicity of corrosive sublimate. Some effects of large doses of these substances are compared.—J. A. G.

4004. Die Guanidin und Dimethylguanidin Toxikose des Säugetiers und ihre physiopathologische Bedeutung. E. Frank, R. Stern, and M. Nothmann (*Zeit. f. d. ges. exp. Med.*, 1921, **24,** 341-70).—The effects of guanidine poisoning, especially the effects on movements and tone, are described. Small doses which produce no symptoms, nevertheless increase the excitability of the nerves; this effect is due to changes in the peripheral nerves, and not to an effect on the anterior horn cells. Guanidine in small doses reinforces the convulsant effect of picrotoxine, and also the effect of such parasympathicotropic drugs as acetyl choline or physostigmine. The symptoms of spasmophilia are very accurately reproduced by dimethyl guanidine, which is regarded by the authors as the probable toxin in tetany, and as the substance responsible for the maintenance of muscular tone.—H. W.

4005. Recherches sur l'anémie expérimentale produite par la saponine. J. Firket (*Compt. rend. soc. belge biol.*, 1921, 727-9).—La saponine ne produit pas une aplasie véritable de la moelle osseuse et stimule au contraire l'hyperplasie de celle-ci. Mais les hémorragies diffuses provoquées par la saponine entraînent une organisation cicatricielle, rendant l'hyperplasie fonctionnelle inefficace.—E. Z.

4006. Choc passif chez le cobaye par injection intracardiaque de sérum d'intolérants et d'arsénobenzène. A. Tzanck (*Compt. rend. soc. biol.*, 1921, **85,** 839).—If serum from a patient who shows a maximum degree of intolerance to arsenobenzene is injected, together with 0·01 gm. sulfarsénol, into the heart of a guinea-pig, the animal at the end of 3 minutes shows symptoms resembling those of anaphylactic shock.—J. H. B.

4007. Contribution à l'étude de la colloidoclasie. P. Brusselmans (*Rev. méd. Louvain*, 1921, 223-32).—A la suite d'une crise colloidoclasique due à l'introduction intraveineuse de néosalvarsan, l'auteur à vu guérir un cas de kératite parenchymateuse. L'auteur discute la thérapeutique colloidoclasique et met en garde contre ses dangers. —E. Z.

4008. Studies of Chronic Intoxications on Albino Rats. V. Arsenic Trioxide. T. Sollmann (*J. Pharm Expt. Ther.*, 1921, **18,** 43-9).—Arsenic trioxide, when administered to rats in their food over long periods (9 to 24 weeks), produces distinct retardation of growth and diminution of appetite in doses which, calculated to body weight,

would represent $\frac{1}{800}$ to $\frac{1}{4}$ of the maximum single therapeutic dose used in man.—J. A. G.

4009. Arsenic Compounds. I. The Influence of Fasting and Diet on Arsphenamine Poisoning and the Comparative Toxicity of Arsphenamine, Neoarsphenamine, and Para-oxy-meta-amino-phenyl-arsenoxide. C. W. Hooper, A. C. Kolls, and K. Dorothy Wright (*J. Pharm. Expt. Ther.*, 1921, **18,** 133-53).—The authors find, from a very large number of experiments, that starved animals, and more so those fed on sugar alone, are much more susceptible to arsphenamine poisoning than those fed on a mixed diet. Standardisation of diet is important for accurate biological testing of drugs. When the 3 compounds are compared on an arsenic equivalent basis, P- is 5 times more toxic to the rat kidney than N- and $7\frac{1}{2}$ times more toxic than A-. N- and A- react (qualitatively) differently in the animal organism, and are not the same compound. Under certain conditions sodium arsphenamine may produce jaundice and liver necrosis in dogs. For other interesting and suggestive points bearing on the question of the toxicity of arsenical compounds the original paper should be consulted. The very useful review given of previous literature on the effects of diets on intoxications makes somewhat gloomy reading for a Scotch abstractor, as various observers find that a diet of oatmeal may be inferior to one of carrots or even turnips, though a lamentable gap in our knowledge is the effect of an oatmeal diet on the resistance to alcohol. So far, every drug and poison seems to be a law unto itself in regard to what is the diet that most diminishes its toxicity, so that the adequate preparation of a patient for the ingestion of a classical prescription of four ingredients would require some "fine confused feeding."—J. A. G.

4010. Über den Reaktionstypus des Gallenfarbstoffes und über die quantitativen Verhältnisse von Bilirubin und Cholesterin im Blut bei verschiedenen Ikterusformen. F. Rosenthal and K. Meier (*Arch. exp. Path. Pharm.*, 1921, **91,** 246-71).—A useful biochemical analysis of icterus neonatorum, toluylene diamine poisoning, the jaundice of phenyl hydrazine, and of phosphorus poisoning.—J. H. B.

4011. Studi sull' intossicazione proteica. F. Pentimalli. **I. Introduzione** (*Riforma med.*, 1921, **37,** 532-6). **II. Tossicita dell' albumina di uovo e suoi derivati** (*Gazz. intern. med. chir. igiene*, 1921, **29,** 65-72). **III. Tossicita del peptone** (*Rass. intern. clin. e terap.*, 1921, **2,** 185-92). **IV. Tossicita del latte e suoi derivati** (*La pediatria*, 1921, **29,** 481-94). **V. Comportamento della pressione del sangue e della respirazione** (*Folia med.*, 1921, **7,** 321-30). **VI. Comportamento della temperatura del corpo** (*Arch. di sc. biol.*, 1921, **2,** 44-58). **VII. Il nistagmo** (*Riforma med.*, 1921, **27,** 573-8). **VIII. Alterazioni morfologiche del sangue** (*Hæmatologica*, 1921, **2,** 527-78).—I. Plan of work for the study of proteic intoxications. II. The primary toxicity of yolk is very small, and the products variable. The most toxic are the protamines, which are rich in diamino-acids; the mono-amino acids have almost no effect. Repeated injections of protein substances of the egg-albumin type, whether primarily toxic or not, are fatal (anaphylaxis). III. The toxicity of peptone varies according to the sensitiveness of the animal. In favourable conditions it is possible (by Rosenau and Anderson's method) to prolong the treatment for a considerable time. The animals acquire no immunity against increasing doses, but become insensible to equal doses. During the treatment anaphylactic phenomena are sometimes observed. By repeated injections of meat peptone it is possible to cause in rabbits a state of general cachexia ending fatally even if the treatment is stopped. IV. The primary toxicity of milk and its derivatives is about the same as that of egg-albumin; but it is possible to prolong the treatment so as to cause a cachexia similar to that obtainable by meat peptone. V. The blood-pressure is not influenced by casein and egg-albumin. The products of hydrolysis of the latter, milk, and peptone lower the blood-pressure, with consequent troubles of respiration.

VI. The body temperature shows a temporary rise after a first injection of egg-albumin, milk, and peptone. The effect of subsequent injections varies, but if injections of the same protein are repeated at intervals of 24 hours, the body temperature shows, towards the 4th or 5th day, a diminution which may be permanent. These animals die with anaphylactic symptoms even if the treatment is suspended; this end may be avoided if the doses of the subsequent injections are smaller than that of the first. If, after a few months, another injection of the original protein is given, the body temperature again shows a rise. This means that an immunisation of the thermogenic centres does not take place, though a certain degree of general immunity must be present, since the animals become accustomed to progressively diminishing doses, and since Bordet, Gengou, and Moreschi have shown that this is due to the formation of true antigens. VII. Nystagmus may appear, together with other anaphylactic symptoms, or be the only sign of protein intoxication. It may be accompanied by pendular oscillations of the head and dilatation of the pupil. It is reduced or abolished by ether. As a rule it quickly disappears, but may last for hours. VIII. The alterations in the blood vary a little. A first injection of 5 to 10 c.c. of egg-albumin or meat peptone, or of their hydrolytic products, causes slight leucopenia, followed by a pseudo-eosinophile leucocytosis. Prolonged treatment causes a diminution in the number, aspect, and staining properties of red corpuscles, and a leucocytosis which is generally lymphocytic and monocytic in character, but sometimes pseudo-eosinophile. In both cases immature granulocytic cells appear. These changes are generally followed by an increase of platelets. When yolk or milk is used these changes are more intense, and end by polynucleosis and by the presence of many dividing leucocytes. When milk is used the leucocytosis lasts a long time, and was seen even 5 months after the suspension of the treatment. If the milk is boiled such effects are not obtained. The author thinks that egg-albumin and its derivatives cause an anæmia to which the changes in the blood are due, while yolk and milk act primarily as stimulants of the hæmatopoietic organs.—C. d. F.

4012. L'empoisonnement par les champignons vénéneux. R. Bruynoghe (*Rev. méd. Louvain*, 1921, 219-23).—Considérations sur la symptomatologie, l'évolution et le traitement de l'empoisonnement phallinien et l'empoisonnement muscarinien.—E. Z.

4013. The Poison Organs and Venoms of Fish. H. M. Evans (*Brit. Med. J.*, 1921, ii., 690-2).—A description of the organs is given, and the symptoms resulting from injections of extracts of the poison glands into fish, mice, and guinea-pigs, are described. The most efficacious method of treatment of the sting is to inject several minims of a 5% solution of potassium permanganate into the punctured wound with a hypodermic syringe.—D. H. de S.

4014. Intestinal Lesions produced by the Excretion of Poisons. N. Okubo (*Kyoto Igaku Zasshi*, 1918, **15,** No. 2, 156-297; *Jap. Med. Lit.*, 1921, **6,** 4).—When certain poisons such as Bi, Hg, Cr, As, ricin, cantharidin, snake venom, and some bacterial poisons, are introduced into the animal body, they are partly excreted through the mucous membrane of the gastro-intestinal tract. The resulting enteritis is usually most marked in some definite portion of this tract, but is far more diffuse and uniform throughout the tract in very young animals, indicating a less complete development of the tissue and differentiation of its function.—W. D. H. (*Chem. Abstr.*).

PATHOLOGY

4015. Cicatrisation of Wounds. XII. Factors initiating Regeneration. A. Carrel (*J. Exp. Med.*, 1921, **34,** 425-34).—Under the conditions of experiment, a wound protected by a non-irritant dressing shows no granulation tissue or contraction for 25 days at least. Local application of certain irritants, such as turpentine, chick embryo pulp, and staphylococci, reduces the duration of the latent period to less than 2 days. A small wound begins to cicatrise sooner if slightly infected, as practically always happens, than if thoroughly protected by non-irritant dressings.—C. L. E.

4016. Sur le collapsus circulatoire posthémorrhagique. E. Zunz et P. Govaerts (*Arch. intern. de physiol.*, 1921, **17,** 113-37).—Collapsus et mort chez 10% des chiens qui ont perdu par saignée 35 à 45% de la masse de leur sang. Mort dans 70% des cas après une saignée de 45 à 65% du volume sanguin. Mort dans 18% des cas après une saignée de plus de 65% du sang. Après la fin de cette saignée abondante, la pression artérielle se relève légèrement pendant environ 3/4 d'heure, reste au même niveau pendant un certain temps, puis se remet à descendre lentement et enfin beaucoup plus brusquement lorsqu'on est arrivé au niveau dangereux de 25 à 30 mm. Hg. La dilution du sang par résorption de lymphe [diminution du nombre de globules par mm.^{3}, diminution de la teneur du sérum en protéines, qui avant la saignée était de 6·66% en moyenne] est d'abord très rapide, puis de plus en plus lente. Chez quelques chiens la teneur du sérum en protéines tend ensuite à se relever. Les chiens qui supportent le plus mal la saignée sont souvent ceux dont le sérum était particulièrement pauvre en protéines.—L. F.

4017. Alimentary Arteriosclerosis in Castrated Animals. K. Murada and B. Katsaka (*Nisshin Igaku*, 1918, **7,** No. 8; *Jap. Med. Lit.*, 1921, **6,** 13-4).—This condition in castrated rabbits was apparently due to the hypercholesterolæmia and the deposition of both neutral and doubly refracting fat in the walls of the vessels.—W. D. H. (*Chem. Abstr.*).

4018. Über alimentäre Anämien. A. Brinchmann (*Zeit. f. Kinderheilk.*, 1921, **30,** 158-94).—After feeding young guinea-pigs on Fe-poor food anæmia of chlorotic type ensues. There is also degeneration of the liver. The milk of other animals diminishes Fe absorption.—H. W.

4019. Significance of Urobilin. L. Bauman (*Arch. Int. Med.*, 1921, **84,** 475-83).—Urobilin (derived from bilirubin by bacterial reduction in the large intestine) is found in increased amounts in the urine in diffuse lesions of the liver (fatty degeneration, cirrhosis, etc.). It is absent when the flow of bile to the intestine is checked. Its presence in the stools serves to differentiate between pernicious and secondary anæmia, for in the latter condition it is wanting.—J. H. B.

4020. Über den Harnstoffgehalt des Blutes bei der alimentären Intoxikation. R. Wilmanns (*Monats. f. Kinderheilk.*, 1921, **21,** 31-8).—In infants during alimentary disturbances unaccompanied by intoxication there was an increase of urea in the blood from a normal value of about 39 to about 49 mgm. per 100 c.c. In true alimentary intoxication the mean value may rise to 62·5 and even to 100 mgm. if disturbance of renal function also occurs. These high urea figures are said to be due to the action of toxic products absorbed through an abnormally permeable intestine wall; they are not produced by a mere concentration of the blood by loss of water.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4021. Nitrogenous Metabolites in Blood. H. F. Höst and R. Hatlehol (*Quart. J. Med.*, 1921, **15,** 43-54).—Cautious conclusions, but there is a parallelism (4 patients) between increasing concentration of residual N, urea N, and creatinine, and the onset of uræmia.—W. D. H.

4022. Changes in the Dissociation Curve of the Blood in Experimental Fever and Feverish Diseases. M. Yamakita (*Tohoku J. Exp. Med.*, 1921, **2,** 290-323).—Pyrexia induced by puncture of the corpus striatum or injection of peptone, Koch's old tuberculin, or typhoid toxin is accompanied (with some individual exceptions) by a decrease in the % saturation of the blood with O_2. The relation between fever and acidosis is not strictly parallel, but is approximately so after typhoid toxin injection. During the febrile periods of phthisis, influenzal pneumonia, and typhoid fever, acidosis is also present. The acidosis is attributed partly to tissue disintegration and partly to the rise of body temperature itself. Injection of Na_2CO_3 improves the % O_2 saturation of the blood in animals with fever, and may do so in febrile diseases of man.—R. K. S. L.

4023. Zur Kenntnis des heterogenetischen Hammelblutantigens. K. Meyer (*Biochem. Zeit.*, 1921, **122,** 225-31).—The alcoholic extract of guinea-pig and horse kidney reacts with the antisera of guinea-pig and horse kidney with fixation of complement. The activity of the extract was found in the acetone insoluble lipoids.—H. K.

4024. Reactions of the Nasal Cavity to Chilling. S. Mudd, S. B. Grant, and A. Goldman (*J. Exp. Med.*, 1920, **32,** 87-112; *J. Inf. Dis.*, 1921, **29,** 151-60; *Ann. Otol. Rhinol. and Laryngol.*, March, 1921, reprint, pp. 73).—The subject is here treated from the clinical aspect in reference to inflammatory and infectious conditions (compare Abstracts Nos. 937-8, Vol. V., p. 146; Nos. 1512, 2720, Vol. VI., pp. 221 and 392).—W. D. H.

4025. Postural Proteinuria. G. A. Harrison (*Lancet*, 1921, ii., 991-4).—Proteinuria is suggested instead of albuminuria, but no details are given as to kind of protein dealt with; 4 cases in young people of kidney trouble, 2 due to slight disease, and 2 spoken of as "functional." Proteinuria disappeared in the recumbent posture; but as in some cases the intermittency occurred even if the erect posture was maintained, the adjective "postural" seems inappropriate.—W. D. H.

4026. Acidosis. XVII. The Normal and Abnormal Variations in the Acid-Base Balance of the Blood. D. D. van Slyke (*J. Biol. Chem.*, 1921, **48,** 153-76).—A discussion of recent work on this subject.—T. A. W.

4027. Hæmolytic Activity. E. Ponder (*Proc. Roy. Soc.*, 1921, **92B,** 285-95).—A technique for the investigation of the hæmolytic action of chemical substances is described. The relation between the time taken by a given quantity of hæmolytic substance and the temperature at which it acts is expressed by a hyperbola. Equations are given, expressing the relation between the constants of such a hyperbola and the quantity of hæmolytic substance to which the hyperbola applies. Certain general relations which have been found to hold for all substances examined in connection with this research are pointed out. A comparison between experimental and calculated results is given.—*Author's Abstract.*

4028. Non-Lipoid Components of Serum and Antihæmolysis. H. M. Clark, R. H. Zinck, and F. A. Evans (*Bull. Johns Hopkins Hosp.*, 1921, **32,** 328-36).—Removal of all or part of the proteins lessens the protective power of serum against hæmolysis by saponin and sodium oleate. Ca alone is not the protective agent. Glucose and soluble starch are also ineffective. Boric acid diminishes protection against the oleate, but not against saponin.—W. D. H.

4029. Die Genese des Amyloids. A. Frank (*Beitr. z. path. Anat. u. allg. Path.*, 1920, **67,** 181-205).—The view advanced is briefly that amyloid degeneration in protoplasm is due to the action of toxins which are elaborated by various kinds of bacteria. The basis of amyloid is protein, which adsorbs other substances, and it is to the latter that it owes its iodine reaction.—W. D. H.

4030. Experimental Tar Cancer in Mice. J. A. Murray and W. H. Woglom (*Scient. Rep. Imp. Cancer Res. Fund*, 1921, **7,** 45-61).—Prolonged application of coal tar to the

skin of mice produces malignant new growths. The malignancy of these tumours is deduced from their progressive growth after tarring has stopped, from the success of autoplastic transplantation and the occurrence of metastases, and from their histological appearances. All animals seem to be susceptible, but great variations are met with in the duration of the treatment necessary. The malignant change supervenes in small foci in the irritated area, and not as a diffuse change affecting all the cells exposed.—C. d. F.

4031. Digestive Activity of Mesenchyme. A. The Ehrlich Sarcoma Cells as Object. Vera Danchakoff (*Amer. J. Anat.*, 1921, **29,** No. 4).—The activity of the splenic mesenchyme is the determining factor in the disappearance of mammalian tumours grafted on the embryonic chick allantois in close contact with the splenic tissue of the adult fowl. Mammalian tumour tissue (Ehrlich sarcoma and tumour 180) grows well if grafted alone on the allantois. Neither embryonic splenic tissue nor aseptic dead adult splenic tissue affects its growth. Only adult living mesenchymal splenic cells brought into immediate contact with tumour cells surround and encapsulate them, and then digest them in so-formed small cavities.—W. D. H. (*W. I.*).

PLANT PHYSIOLOGY

GENERAL

4032. Plant Dermatitis. T. A. Sprague (*J. Bot.*, 1921, **59,** 308-10).—Mentions a number of plants belonging to the N.O. Anacardiaceæ which are known to cause dermatitis.—C. W.

4033. Preparation of Collodion Sacs for Use in Bacteriology. F. L. Gates (*Proc. Soc. Expt. Biol. and Med.*, 1920, **18,** 92).—The collodion sacs are made on a gelatine capsule foundation, which is subsequently dissolved out with hot water. "The essentials of the method are the alcohol treatment of the collodion membranes as recommended by Brown, 1915."—W. S.

CHEMICAL

4034. Über Weinhefe und deren Kupfergehalt. F. Wirthle and K. Amberger (*Zeitsch. f. Unters. d. Nährungs- u. Genüssmittel*, 1920, **12,** 365-6).—Cu in yeast from young wine fermentation was found to the extent of 0·01% on wet basis and 0·0205% on dry basis.—W. S. (*Abstr. Bacteriol.*).

4035. Der Gehalt junger Fruhjahrsblätter, an Oxalsäure sowie einige Bemerkungen über diese Säure. A. Bau (*Zeitsch. f. tech. Biol.*, 1921, **8,** 151-5).—Oxalic acid was found present in young leaves of elder, hawthorn, and horse-chestnut, and in those of young barley plants.—W. S. (*Ber. ü. d. ges. Physiol.*).

4036. Über die Verbreitung des Titans in Böden und Pflanzen. Geilmann (*Biedermann's Zentr.*, 1921, **50,** 122-5).—Titanium was found in all soils examined, being most abundant in clay soils (up to 1%), less so in loams, still less in sands, and least in calcareous soils. Titanium is also present in plants, particularly in assimilatory organs. Leguminosæ show the same content of Ti in the ash, so do wheat and oats, although meadow grass gives a higher value than these latter.—W. S. (*Ber. ü. d. ges. Physiol.*).

4037. Hydrocyanic Acid in Sudan Grass. C. O. Swanson (*J. Amer. Soc. Agron.*, 1921, **13,** 33-6).—Rough quantitative tests showed the presence of appreciable amounts of HCN in the fresh grass. The HCN disappears on wilting.—R. C. K.

4038. Manganese in Commonly Grown Legumes. J. S. Jones and D. E. Bullis (*J. Ind. Eng. Chem.*, 1921, **13,** 524-5).—The quantities found varied from 0·0023% of air-dry weight in alfalfa to 0·0068% in alsike. In general, the distribution in the

plant was as follows in descending order of magnitude: leaves, bloom, stems, seeds.—R. C. K.

4039. Yield and Composition of Wormwood Oil from Plants at Various Stages of Growth during Successive Seasons. F. Rabak (*J. Ind. Eng. Chem.*, 1921, **13,** 536-8).—Dry hot seasons result in high yields of oil from *Artemisia absinthium.* In any one season the highest yield is from plants collected in the flowering period.—R. C. K.

4040. Cellulose Content of Spruce Wood. P. Klason (*Svensk Pappers Tidning*, 1921, **24,** 7).—By digesting spruce wood for 10 to 20 days, the following results were obtained: Cellulose free from pentosans, 53%; hemicellulose, 15%; lignin, 30%; other substances, 2%.—W. S. (*Chem. Abstr.*).

4041. Cellulose Mucilage. Jessie E. Minor (*J. Ind. Eng. Chem.*, 1921, **13,** 131-3).—Deals with products of hydrolysis of cellulose.—R. C. K.

4042. Constitution of Cellulose—I. H. Hibbert (*J. Ind. Eng. Chem.*, 1921, **13,** 256-60, 334-42).—Matter indicated by title.—R. C. K.

4043. Recherches sur les sucres. A. Pictet (*Arch. des sci. phys. et nat.*, 1921, **3,** 423; *Compt. rend. de la soc. chim. Genève*).—Attempts to prepare hexosans for disaccharide synthesis were successful with levulose and maltose. Polymerisation of a maltosan produced a dextrin.—R. C. K.

4044. Essais de synthèse des disaccharides. A. Pictet (*Compt. rend. soc. phys. et d'hist. nat. Genève*, 1921, **38,** 4-5).—Glucosans were polymerised to a disaccharide. Hexosans were polymerised to dextrins by zinc chloride, and treatment of the dextrins with oxalic acid produced a disaccharide resembling maltose.—R. C. K.

4045. Atropine Sulphate from Datura stramomium. H. W. Rhodehamel and E. H. Stuart (*J. Ind. Eng. Chem.*, 1921, **13,** 218-20).—Description of a method of extraction by adsorption.—R. C. K.

4046. Rapid Dry Combustion Method for the Simultaneous Determination of Soil Organic Matter and Organic Carbon. J. W. Read (*J. Ind. Eng. Chem.*, 1921, **13,** 305-7).—Involves the use of a special combustion boat with a perforated bottom. Considerable saving of time is claimed.—R. C. K.

4047. Estimation of Colloidal Material in Soils. C. J. Moore, W. H. Fry, and H. E. Middleton (*J. Ind. Eng. Chem.*, 1921, **13,** 527-30).—2 methods are described, depending respectively upon the absorption by the soil of dry ammonia and of malachite green in solution.—R. C. K.

4048. Studies on the Acid Amide Fraction of the Nitrogen of Peat—I. E. J. Miller and C. S. Robinson (*Soil Sci.*, 1921, **11,** 457-67).—Glutamic acid cannot be separated directly from the hydrolysate of peat, but by the application of Foreman's method the separation of both glutamic and aspartic acids and the estimation of pyrrolidon carboxylic acid from this material has been accomplished.—C. W.

ENZYME ACTION

4049. Nature of Alcoholic Fermentation. C. C. Warden (*Amer. J. Physiol.*, 1921, **57,** 454-69).—The conclusion is drawn from experiments described, more especially as to the effect of the addition of surfaces of various kinds, that alcoholic fermentation is a catalytic process occurring at the surface of yeast cells, on the colloidal surfaces of yeast juice, and at artificial surfaces composed of fat complexes similar to those found in yeast cells. Further, that the enzyme of yeast belongs to the cellular antigens. Interesting considerations as to the nature of enzyme action on anti- and co-enzymes will be found in the paper.—W. M. B.

4050. Les enzymes du malt, à propos de la note de Marc H. van Laer " Sur l'existence d'une lipase dans l'extrait de malt." D. Maestrini (*Compt. rend. soc. biol.*, 1921,

84, 616-7).—Germinating barley contains a lipase. The maximum activity is in a medium of definite acidity (0·4% HCl); in a medium containing 0·9% HCl the reaction is weakened. The optimum temperature is 45°. The enzyme is destroyed at 55°.—W. S.

4051. Fermentation Process for the Production of Acetic and Lactic Acids from Corn Cobs. E. B. Fred and W. H. Peterson (*J. Ind. Eng. Chem.*, 1921, **13,** 211-3).—The cobs are hydrolysed with weak sulphuric acid under steam pressure, and then fermented by inoculation with *Lactobacillus pentoaceticus*, which converts 85 to 90% of the sugar present into acetic and lactic acids in the proportion of about 45 : 55.—R. C. K.

VEGETATIVE DEVELOPMENT

4052. A propos de l'autotomie chez les végétaux. E. de Wildeman (*Compt. rend. soc. belge de biol.*, 1921, 717-20).—Reprenant les données de Blaringhem, l'auteur rappelle que si l'autotomie est rare chez les végétaux, il convient de citer les cas des *Castilla* et *Bacteria fistulosa*, qui se débarrassent de certains rameaux.—E. Z.

4053. A Curious Potato Inflorescence. G. C. G. (*Gard. Chron.*, 1921, **70,** 277).—Describes and figures tubers formed on the inflorescence of a potato plant.—C. W.

4054. Chemical Control of Sugar-Beet Fields. J. Hamous (*Listy Cukrovar*, 1920, **38,** 173-4).—Curves are given showing increase in weight and sugar content of beetroot during growth.—W. S. (*Chem. Abstr.*).

GROWTH OF LOWER PLANTS

4055. Zur Bedeutung und Technik der Reinkultur für Systematik der Algen. F. von Wettstein (*Österreich bot. Zeit.*, 1921, **70,** 23-8).—The cultivation of algæ in pure culture makes possible the recognition of different growth forms of the same alga, and may lead to the discovery of rare forms which up to the present have been overlooked. Two solutions with 1 to 2% agar are recommended: Benecke's purely inorganic solution (NH_4NO_3 0·2 g., $CaCl_2$ 0·1 g., K_2HPO_4 0·1 g., $MgSO_4$ 0·1 g., $FeCl_3$ a trace, water 1,000 g.), and a solution containing also organic constituents (solution A: $[NH_4]_3PO_4$ 0·2 g., $MgSO_4$ 0·05 g., $CaCl_2$ 0·05 g., $CaSO_4$ 0·05 g., K_2HPO_4 0·05 g., $FeCl_3$ a trace, water 1,000 g; solution B: decoction of 250 g. peat in 1,000 g. water; one part of both A and B is taken to make the complete solution).—W. S. (*Ber. ü. d. ges. Physiol.*).

4056. Nutritive Value of Yeasts. K. W. Jötten (*Arb. Reichsgesund.*, 1920, **52,** 339-74).—Extracts of beer yeast can serve as satisfactory protein food for bacteria.—W. S. (*Chem. Abstr.*).

CROP YIELD

4057. A Critical Study of Fertiliser Experiments. C. B. Lipman and G. A. Linhart (*Chem. News*, 1921, **122,** 137-8; from *Proc. Nat. Acad. Sci., U.S.A.*).—A summary of the deductions from the results of a statistical treatment of the manurial experiments at Ohio and Pennsylvania Experiment Stations. Following the conclusions that the kind and quantity of fertiliser used are without significance comes the assertion that it is highly probable "that no fertiliser experiment as ordinarily conducted is possessed of sufficient practical value to justify the large expenditure of money, time, and energy involved."—R. C. K.

4058. Liming. J. J. Griffith (*J. Min. Agric.*, 1921, **28,** 341-9).—The results of pot experiments with trefoil are given.—C. W.

4059. The Influence of Certain Fertiliser Salts on the Growth and Nitrogen Content of Some Legumes. A. MacTaggart (*Soil Sci.*, 1921, **11,** 435-55).—The author concludes that in general it may be said that when any application of fertiliser, with the exception

of gypsum, increased the yield of the leguminous plants used in his tests, there was also an increase in the percentage of nitrogen in the plants. In general, there appeared to be a tendency towards correlation between the dry matter produced and subsequent soil nitrification, due in part, it is assumed, to the greater root system associated with greater top growth, hence to greater amounts of decayed roots for promoting nitrification.—C. W.

4060. The Fixation of Atmospheric Nitrogen by Inoculated Soy-Beans. E. B. Fred (*Soil Sci.*, 1921, **11,** 469-77).—From the results of a field experiment with Ito San soy-beans inoculated and uninoculated on Plainfield sand, the author concludes that inoculation increased the yield of soy-beans 1,787 pounds per acre, or more than threefold. Apart from the increased yield, inoculation brought about an increase in the percentage of nitrogen in the tops and roots. As shown by the growth of rye on the same ground the following year, the residue of soy-bean roots and nodules from inoculated plants is clearly beneficial to the growth of other plants.—C. W.

4061. Field Tests on the Inoculation of Canning Peas. E. B. Fred, W. H. Wright and W. C. Frazier (*Soil Sci.*, 1921, **11,** 479-91).—The results of the tests described indicate that in general it is advantageous to inoculate peas. There is also a gain in nitrogen in the residual soil where the inoculated plants have been grown, hence the inoculated plants act as a nitrogenous fertiliser.—C. W.

4062. The Influence of Fertilisers containing Borax on the Yield of Potatoes and Corn, Season 1920. A. W. Blair and B. E. Brown (*Soil Sci.*, 1921, **9,** 369-83).—Report of field experiments carried out to ascertain the effects of different concentrations of borax upon the growth and yield of potatoes and corn.—C. W.

4063. Die Düngung mit Schwefel. F. F. Matenaers (*Biedermann's Zentr.*, 1921, **50,** 129-30).—Manuring lucerne with sulphur has resulted in increased yield up to 100%.—W. S. (*Ber. ü. d. ges. Physiol.*).

4064. Der Einfluss von Kalk und Magnesia auf das Wachstum der Pflanzen. T. Pfeiffer and A. Rippel (*Biedermann's Zentr.*, 1921, **50,** 130-2).—See Abstract No. 1098, Vol. VI., p. 163.—W. S.

4065. Kartoffeldüngungsversuche mit Kalisulfaten im Erntejahr, 1920. Mit Berücksichtigung der Magnesiafrage. Hoffmann (*Mitt. deut. Landw.-Ges.*, 1921, **36,** 116-7).—The author was unable to derive definite conclusions as to the relative action of different K manures.—W. S. (*Ber. ü. d. ges. Physiol.*).

4066. Über Haferdüngungsversuche mit fallenden Phosphorsäuregaben. W. Zielstorff (*Mitt. deut. Landw.-Ges.*, 1921, **36,** 213-5).—Increase in yield in the case of 2 different soils is recorded.—W. S. (*Ber. ü. d. ges. Physiol.*).

4067. Düngungsversuche mit magnesiahaltigen und magnesiafrien Kalisalzen. O. Nolte (*Mitt. deut. Landw.-Ges.*, 1921, **36,** 136).—Neither the application of KCl nor $K_2Mg(SO_4)_2$ increased the yield of potatoes.—W. S. (*Ber. ü. d. ges. Physiol.*).

4068. Die Kohlensäureernährung der Pflanzen und der Stalldünger. Gerlach (*Mitt. deut. Landw.-Ges.*, 1921, **36,** 147-50).—Contrary to the opinion of Bornemann, the author holds the increase in yield brought about by addition of stable manure is to be traced to the inorganic salts in the manure, and not to enrichment of the atmosphere in CO_2. —W. S. (*Ber. ü. d. ges. Physiol.*).

ASSIMILATION

4069. Ljuset i fruktträdkronorna. M. G. Stålfelt. (*Pomologisk Årsskrift*, 1920, 125-36).—The author has investigated the intensity of CO_2 assimilation in sun and shade leaves of different fruit trees. The assimilation begins at a light intensity of $\frac{1}{45}$ to $\frac{1}{50}$. The maximal intensity of the CO_2 assimilation is in sun leaves about 5 to 6 mg. CO_2 per hour for 100 cm.^{2}, in shade leaves about 3 to 4.—B. J.

4070. Ecological Studies in the Assimilation of Certain Forest Plants and Shore Plants. H. Lundegårdh (*Svensk. botan. Tidskrift*, 1921, **15,** 46-95).—The author sums up his results as follows: With a variation of the light intensity and with normal CO_2 percentage in the air (0·57 mg. per litre), curves of the Blackman type were obtained for all the shade plants. With light up to $\frac{1}{10}$ to $\frac{1}{20}$ the assimilation seems to be more or less proportional to the intensity of light. Above $\frac{1}{10}$ light no further rise took place. For Nasturtium a curve of a more logarithmic pattern was obtained. With constant light the assimilation rises with the CO_2 supply up to a certain height, which is determined by the light intensity. In Nasturtium and *Viola tricolor* at $\frac{1}{4}$ light and in oxalis and Melandrium at $\frac{1}{40}$ light an approximate direct proportionality was obtained between the CO_2 concentration and the intensity of assimilation. In other cases the assimilation rose more slowly than the CO_2 concentration. An increase of the CO_2 absorption with abnormally high CO_2 concentration in the air was observed even with small quantities of light ($\frac{1}{40}$). From this fact it may be concluded that the light and the carbon dioxide mutually affect each other's influence as a controlling factor. The intensity of respiration is lower in the shade plants than in Nasturtium and other sun plants. An equilibrium between respiration and assimilation is reached in the case of the shade plants at $\frac{1}{120}$ to $\frac{1}{140}$ light with normal air. In order that the daily assimilation may compensate the respiration of the night-time there is required at 18° an average illumination of $\frac{1}{93}$ light. In order that the growth of the vegetation may be maintained there is further required, in the case of Oxalis, a minimum daily illumination of, for example, $\frac{1}{4}$ light for somewhat more than 1 hour. Among the shade plants Oxalis has the greatest maximum assimilating power. This fact in part explains why Oxalis in nature can support on the average the lowest light intensity. In Nasturtium, Atriplex, and other sun plants, in normal air an equilibrium between respiration and assimilation is reached at $\frac{1}{40}$ to $\frac{1}{60}$ light.—B. J.

4071. Influence de la conductibilité de l'air sur la photosynthèse (Note préliminaire). Marguerite Henrici (*Arch. des sci. phys. et nat.*, 1921, **3,** 276-90).—Previous experiments showed that certain species from Alpine habitats gave increased assimilation figures when in an atmosphere ionised by means of thorium oxide. The same species from a lowland habitat gave the reverse result, but in feeble illumination the lowland individuals behaved like the Alpine ones. Temperature changes do not affect these relationships. Increase in CO_2 concentration progressively decreases the action of ionisation. No explanation is offered beyond the suggestion that CO_2 diffusion is accelerated.—R. C. K.

4072. The Formation of Carbohydrates in Plants. E. C. C. Baly and I. M. Heilbron (*J. Soc. Chem. Ind.*, 1921, **40,** 377-9R).—Experiments *in vitro* on the influence of u.v. light on an aqueous solution of CO_2 confirmed the result obtained by Moore and Webster —*i.e.*, no formaldehyde was obtained. It is, however, unnecessary to introduce an inorganic "catalyst," as Moore and Webster did, in order to produce H.CHO. Agitation of the liquid is sufficient to accomplish this. The explanation is (*a*) without agitation the oxygen produced during the reaction forms H_2O_2 and oxidises the H.CHO to formic acid, and (*b*) any unoxidised H.CHO is polymerised under the influence of the u.v. light. Agitation removes the aldehyde to regions where the light is less intense. The action of Moore and Webster's "catalysts" is explained by the fact that these substances absorb u.v. light of long wave-length, which is the active agent in the polymerisation, and thus the formaldehyde—produced by the action of the shorter wave-length light —is allowed to accumulate. Neither of these two stages in the process can take place in visible light without the intervention of a photocatalyst, the mechanism of whose action is discussed. The analogous action of chlorophyll *in vivo* is analysed, and evidence is adduced to show that under these conditions the $CO_2 \longrightarrow$ carbohydrate

synthesis is carried through without a break, the formaldehyde having but a transient existence in the leaf, so that failure to detect it cannot be regarded as evidence against the rôle it is said to play.—R. C. K.

WATER RELATIONS

4073. The Water Relations of the Pine and the Silver Tree. R. D. Aitken (*Trans. Roy. Soc. S. Africa*, 1921, **10,** 5-19).—The plants involved were 2 evergreens, a *Pinus* and a *Leucadendron*. Wood conductivity was measured by Farmer's method ,and transpiration by potometers. The conductivity of *Pinus* was low, but that of the *Leucadendron* approached the results obtained by Farmer for deciduous trees. On the other hand, the transpiration from *Pinus* was far greater than that from *Leucadendron*.—R. C. K.

4074. The Relation of Moisture Content to the Deterioration of Raw Dried Vegetables upon Common Storage. H. C. Gore and C. E. Mangels (*J. Ind. Eng. Chem.*, 1921, **13,** 523-4).—A maximum water content was found for several varieties, above which deterioration in storage could be expected.—R. C. K.

4075. The Effects of Yeast Vitamin Water-Soluble B on Plant Cell Masses and on Biocolloids. D. T. MacDougal (*Proc. Soc. Expt. Biol. and Med.*, 1920, **18,** 85-7).—The swelling of a number of colloidal preparations and plant tissues in water was compared with that of the same substances and tissues in a 0·1% aqueous solution of water-soluble B yeast vitamin. The P_H of the solution was 5·25. Increased swelling was observed to result from the presence of the vitamin with agar, agar+soap, agar+gelatine, agar+gelatine+salts, gelatine, mature fruits, pith, and joints of plants, dried cell masses of roots and joints of *Opuntia*, root-tips of orange seedlings and strawberry plants. Decreased swelling in the vitamin solution as compared with water was noted in agar+salts, agar+gelatine+soap, gelatine+salts, gelatine+soap, young tubers of potato, roots of maize.—W. S.

4076. The Specific Electrical Conductivity of the Tissue Fluids of Desert Loranthaceæ. J. A. Harris and A. T. Valentine (*Proc. Soc. Expt. Biol. and Med.*, 1920, **18,** 95-7).—The osmotic pressure, electrical conductivity, and ratio of electrical conductivity to osmotic pressure are all greater in the tissue fluids of desert Loranthaceæ than in the tissue fluids of the host plants of these parasites.—W. S.

RESPIRATION

4077. Comparative Studies on Respiration. XVI. Effects of Hypotonic and Hypertonic Solutions upon Respiration. O. L. Inman (*J. Gen. Physiol.*, 1921, **3,** 533-7).—Laminaria was employed as experimental tissue. The respiration is lowered after treatment with either hypotonic or hypertonic solutions, but more in the case of the latter than the former. With hypotonic solutions the relation between concentration and respiration is complex; with hypertonic concentrations the relation is a linear one. —W. S.

IRRITABILITY

4078. Summation of Dissimilar Stimuli applied to Leaflets of Sensitive Briar (Schrankia). L. B. Bibb (*J. Gen. Physiol.*, 1921, **3,** 523-6).—If a small contact stimulus is followed by a small chemical stimulus the two effects add together.—W. S.

4079. Some Chapters in Modern Botany. J. Small (*Proc. Belfast Nat. Hist. and Phil. Soc.*, 1921, 85-106).—The questions discussed are the wanderings of the groundsel and the erectness of plants. The latter is an account of the author's hydrion differentiation theory and extensions of it.—W. S.

GENETIC FACTORS

4080. Inheritance of Disease Resistance in the Common Bean. G. P. McRostie (*J. Amer. Soc. Agron.*, 1921, **13,** 15-32).—An attempt to produce disease-resisting varieties, and at the same time to study the mechanism of the inheritance of resistance. —R. C. K.

4081. A Preliminary Note on the Inheritance of Rust Resistance in Oats. R. J. Garber (*J. Amer. Soc. Agron.*, 1921, **13,** 41-3).—Resistance appears to be a dominant. —R. C. K.

ENVIRONMENTAL FACTORS

4082. The Reaction of Plants to New Habitats. D. T. MacDougal (*Ecology*, 1921, **2,** 1-20).—Seeding and transplantation experiments extending over 14 years showed that plants have considerable capacity for variation in unusual habitats. Comparisons were made of the water and carbohydrate content of *Opuntias* grown at a coastal station (rainfall 10 to 26 inches) and at Tucson, over 2,000 feet up (rainfall 3 to 10 inches). The coastal plants showed an increase of water content to 91% over the 80% of the desert individuals. There was a corresponding decrease of total sugars from 4·3 to 2·6%, whereas hexoses alone were higher in the coastal plants—0·52% against 0·06%. Various changes of habit are noted as the result of change of habitat; for example, *Verbascum thapsus*, introduced on the coastal region, gave rise to tall shoots perennating and blooming continuously for 4 years.—R. C. K.

4083. The Relation of the Hydrogen-Ion Concentration of Nutrient Solutions to Growth and Chlorosis of Wheat Plants. A. G. McCall and J. R. Haag (*Soil Sci.*, 1921, **12,** 69-77).—Wheat plants were grown for 2 months in 4 different basic nutrient solutions, each of which was modified in such a way as to have 3 distinctly different P_H values without materially altering the solutions with respect to the concentration of the 6 essential ions. It was found that the hydrogen-ion concentration not only exerted a marked influence upon the growth rate, but also was an important factor in the control of chlorosis. The indications were that the plants grown in solutions having P_H values ranging from 4·02 to 7·0 were suffering from the lack of available iron or from faulty metabolism resulting from the immobility of the iron within the plants.—C. W.

4084. Studier over Jordbundens Brintionconcentration. C. Olsen (*Medd. fra Carlsberg Lab. Copenhagen*, 1921, **15,** 1-159).—The H-ion concentration varies in Danish soils from 3·7 to 8·0 (P_H). As shown in the paper, this factor is of essential influence on the composition of plant formations. Every species is confined to soils with a H-ion concentration lying within certain limits. Experiments with water culture showed that plants occurring in acid soils (*Sphagnum rubellum*, *Sph. magellanicum*, *Deschampsia flexuosa*, *Senecio silvaticus*, *Sph. apiculatum*) obtained their maximal growth in solutions with P_H=about 4; plants from weakly acid or neutral soils (*Hordeum distichum*, *Tussilago jasparus*) in solutions with P_H=6 to 7. A theory advanced by Bear and other investigators, according to which plants from acid soils can use ammonium as nitrogen source, while plants from neutral soils require nitrates, and therefore cannot grow in acid soils, is not correct. Ammonium nitrogen and nitrates are of the same value for plants of both types. Acid soils are often deficient in ash constituents, while neutral soils are rich. Yet this fact does not seem to be of great significance as regards the distribution of plants. Also neutral soils can sometimes contain very few nutrients for plants; yet their vegetation is of a quite different appearance from that in acid soils. Hence it appears that the H-ion concentration as such influences the composition of the vegetation.—B. J.

THE SOIL

4085. Inversion of Cane Sugar by Mineral Acid Soil. S. Osugi (*Ber. des Ohara Inst.*, 1920, **1,** 579-97).—Mineral acid soil can invert cane sugar, this inverting activity of the acid soil being attributed mainly to the nature of the soil particles and intimately related to the degree of acidity of its potassium chloride extract. Acid aluminium silicate can invert cane sugar, and is chiefly responsible for the inverting activity of acid soil. The H-ion concentration of the water extract of acid soil is not sufficient to explain its inverting action unless it is assumed that there is a higher H-ion concentration around the soil particles than that of the soil solution.—C. W.

4086. Aqueous Vapour Pressure of Soils. M. D. Thomas (*Soil Sci.*, 1921, **11,** 409-34).—A method of measuring the aqueous vapour pressure lowerings of soil, accurate to 0·01 mm. of mercury at 25° C., is described, and a few experimental results are given illustrating 4 different soils, as well as the influence of adding the common "alkali" salts to one of them. The vapour pressure moisture curves are shown to be rectangular hyperbolæ over a wide range of moisture contents. This means that the vapour pressure is proportional to the reciprocal of the moisture content. The position of each curve depends almost wholly on the texture of the soil in the absence of dissolved material. Correlations are given between vapour pressure and the following properties: Hygroscopic coefficient, wilting coefficient, moisture equivalent, Bouyoucos' "solid water," capillary potential, surface tension, and curvature of the moisture surface.—C. W.

4087. Nitrogen Losses under Extensive Cropping. J. G. Lipman and A. W. Blair (*Soil Sci.*, 1921, **12,** 1-19).—The results are given of a study of the nitrogen losses from a loam soil (in cylinders with natural drainage) which had been under a 5-year rotation of corn, oats (2 years), wheat, and timothy, for 20 years.—C. W.

4088. The Relation of Organic Matter and the Feeding Power of Plants to the Utilisation of Rock Phosphate. F. C. Bauer (*Soil Sci.*, 1921, **12,** 21-41).—Records the results of experiments carried out to ascertain whether organic acids, CO_2, and nitrous acid resulting from the decay of organic matter are active agents in making rock phosphate available to plants.—C. W.

4089. Einfluss der Bodenreaktion auf die Düngung und Fruchtbarkeit der Kulturböden. J. Hasenbaümer (*Mitt. deut. Landw.-Ges.*, 1921, **36,** 80-1).—A too high degree of either acidity or alkalinity can produce harmful results. The degree of acidity depends on (1) free humus acids, (2) mineral acids and soluble acid salts resulting by manuring with acid salts in deficiency of lime, (3) acid silicates, which give acid-reacting compounds by reaction with neutral salts or with water alone. Prolonged drought increases the degree of acidity. Acidity is countered by manuring with chalk marl. Alkalinity tends to occur in light sandy soils manured with marl. It is removed by manuring with K and NH_4 salts and superphosphate.—W. S. (*Ber. ü. d. ges. Physiol.*).

4090. Pflanzenanalyse und Düngung. F. Münter (*Biedermann's Zentr.*, 1921, **50,** 127-9; compare Abstract No. 2767, Vol. VI., p. 398).—Climatic conditions exert so great an influence on the growth of the sugar beet that the percentage N and K_2O can give no idea of the manuring requirements. The limiting values of P_2O_5 in root and shoot are 0·18 and 0·4% respectively. Rules are given for judging the manuring requirements of the soil from the ratios N/P_2O_5 and P_2O_5/K_2O.—W. S. (*Ber. ü. d. ges. Physiol.*).

PATHOLOGY

4091. Unusual Injury to Apples. Anon. (*Gard. Chron.*, 1921, **70,** 268).—States that frost, not spraying, is responsible for the presence of discoloured and hardened tissue around the eye of apples. "Bramley's Seedling" is the variety particularly affected.—C. W.

4092. Mosaic Disease of Potatoes. A. D. Cotton (*J. Min. Agric.*, 1921, **28,** 335-40).—A description of mosaic disease of potatoes, with notes on its occurrence, methods of transmission, etc.—C. W.

4093. Treatment of the Rice Seeds for Helminthosporiose. I. Hot Water Treatment. Y. Nisikado and C. Miyake (*Ber. des Ohara Inst.*, 1920, **1,** 543-55).—The thermal death point of the spores of *Helminthosporium oryzæ* lies between 50° to 52° C. for 10 minutes' exposure. The optimum temperature for spore germination lies between 25° to 30° C. Germination of dry rice seeds is not materially affected by 10 to 15 minutes' treatment with hot water at 54° to 55° C., but it is reduced if the seeds are previously soaked in water at room temperature.—C. W.

4094. On the Selection of a Rust-Immune Variety of Lubia (Vigna sinensis, Endl.). M. T. Hefnawi (*Rep. Hort. Sect. Min. Agric. Egypt*, July, 1919, 1-9).—Gives an account of the environmental and physiological conditions which affect the spread of the rust disease of lubia caused by the fungus *Uromyces appendiculatus*, Link. The effect of the rust upon the growth of the host plant is also described.—C. W.

BOOK REVIEWS

Manual of Physiology. By H. Willoughby Lyle and David de Souza. Second Edition. Pp. 823. London: Henry Frowde and Hodder and Stoughton, 1921.

The original author of this manual, which was published in 1911, has had the assistance and able co-operation of Dr. de Souza in the preparation of a second edition, which exceeds the first by about 80 pages. The difficulties of presenting the chief facts of so comprehensive a subject as physiology in a small compass must be apparent to everyone, and the authors may claim that they have succeeded in accomplishing this with a considerable degree of success. This edition is, beyond question, a useful reference book for those who have taken the customary course of physiological lectures and laboratory work. English-speaking countries are peculiarly fortunate in possessing quite a large number of excellent textbooks, and in this manual, not only are different portions of the subject well arranged, so as to afford much needed help to a student, but an endeavour has been made, wherever possible, to indicate the direct bearing which physiology has upon practical medicine and surgery. The volume contains 140 illustrations and 3 good coloured plates—2 of the various blood-spectra and 1 after Mayou of the fundus oculi.

As might have been expected, Chapter L., on the structure and functions of the eye, is particularly good. There is, however, no reference to the use of the perimeter or of the knowledge obtained by this instrument. Both this and the ophthalmoscope would seem to deserve consideration equally with retinoscopy. Adequate descriptions of the conflicting theories of urinary secretion are given in Chapter XXXIV., but the experimental facts with reference to the threshold and no-threshold bodies secreted by the kidneys and the work of Leathes and others on the reaction of urine might have been included. On page 479 "Ferein" should read "Ferrein." The relation of the medullary respiratory centre to the spinal cells, and particularly the nuclei of the phrenic nerves, is sufficiently important to have been dealt with in Chapter XXIV. Piper's curve of intraventricular pressure probably more exactly represents the pressure variations than that of Hürthle given on page 196. These suggestions in no way diminish the value of a book which must prove of great service both to students and practitioners.—G. A. B.

Traité d'embryologie des vertébrés. By A. Brachet. Paris: Masson et Cie, 1921. Price 60 fr. net.

This interesting work can hardly be regarded as a students' textbook. It is written from the point of view of a special theory of morphogenesis that is by no means generally accepted. The theory is that there are three fundamental growth processes involved in the primary differentiation of the vertebrate body—*acrogenesis*, *cephalogenesis*, and *notogenesis*. The first gives rise to the prechordal portion of the head, or acromerite, which is formed from the "archenteric vault" in front of the original blastopore; the second gives rise to the rest of the head, which is formed from the "deutenteric vault," which in turn is formed by the process of closure of the blastopore from in front backwards; the third gives rise to the trunk, which is formed from a zone of growth and concrescence established at the hinder end of the deutenteric vault. This theory is based mainly on the development of heavily-yolked eggs like those of amphibians, reptiles, and selachians, in which the process of gastrulation is, of course, profoundly modified. It is difficult to apply it to the much more primitive development of Amphioxus, where gastrulation is not obscured and modified by excess of food-yolk. The author concludes that the head and trunk are not to be regarded as secondary differentiations of a primitive body. Each has its own proper "substratum," and presumably the head arose first in phylogeny as it does in ontogeny. Unfortunately Amphioxus, which the author attempts to set aside as being very simplified rather than very simple, but which the vast majority of zoologists regard as the most primitive chordate known, is just the one type in which the differentiation into head and trunk does not occur; it has no head.

It appears to us that the conception of growth centres in the vertebrate embryo, important and interesting as it no doubt is, finds in this work something very like its *reductio ad absurdum*. In order to maintain his views the author has to suppose that the occipital region is really a part of the trunk which has been absorbed by the head, while, on the other hand, the branchial region really belongs to the head, but has invaded the trunk. Moreover, the anterior part of the brain, the olfactory organ, and the eyes are said to belong to the acromerite, so that, after all, the three alleged primary regions of the embryo do not correspond to the actual subdivisions of the body in the adult animal.

The author has, however, allowed his theoretical views to influence profoundly and, as we think, very unfortunately the arrangement of his subject matter. The second part of the work is divided into two "livres," the first dealing with the development of the head and the second with that of the trunk. We note that the acromerite is now decently interred in the head. Nevertheless, as a result of this arrangement the student who wishes to study the development of the central nervous system or of the alimentary canal will find no complete and consecutive account of either, for each is partially dealt with in each book.

There is much useful information in the work and many excellent illustrations, but it is curiously incomplete in certain respects. Thus we find no account of the development of the vertebrate skeleton, not even of the cranium, nor of the aortic arches. On the other hand, a large amount of space is devoted to the development of the cranial nerves and of the excretory system. The work does not, of course, profess to be comprehensive, but the principle governing the selection of the subject matter is not very clear. According to the preface, some parts of the subject have an interest that is properly embryological, while others are little more than preliminaries to the study of histology and comparative anatomy, and these latter have been more summarily dealt with. The advisability or even possibility of any such distinction appears to us to be very doubtful.—A. D.

H. K. LEWIS & CO. LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

GENERAL

4095. Biological Action of Radiations. S. Russ (*J. Röntgen Soc.*, 1920, **16,** 134, 139-41).—A general article dealing with the action of various kinds of rays on cells. —W. D. H.

4096. The Physiology of Symptom Production in Disease and Injury of the Nervous System. F. M. R. Walshe (*Brit. Med. J.*, 1921, ii., 837-9).—Reasons are given for the conclusion that the first line of attack upon the problems of disordered function in the nervous system must be physiological. The psychical disturbances produced by anoxæmia are but one of many indications that "we cannot afford to abandon the help of the rapidly increasing wealth of physiological knowledge in favour of the verbal methods of research and the allegories of clinical psychology."—D. H. de S.

4097. Accoutumance expérimentale à l'insolation ou à la chaleur. Accoutumance ou immunité. C. Richet, Jr. (*Compt. rend. soc. biol.*, 1921, **85,** 980-1).—If mice are exposed to a temperature of 36° or 40° C. for 40 minutes or an hour daily, after 20 days they are better able to stand (*i.e.*, a larger number survive) a severe exposure to more intense heat than are normal mice. This degree of tolerance develops slowly, and passes off after a time.—J. H. B.

4098. Über die Einwirkung von Metallen auf Sera—I., II., and III. L. Hess and R. Reitler (*Biochem. Zeit.*, 1921, **123,** 51-68).—Active sera are more easily precipitable by polished copper than inactive (complement-free) sera. This observation is made use of for examining a number of biological properties of sera.—H. K.

4099. Die Theorie der Segmentkapsel (Rotationskapsel). O. Frank (*Zeit. Biol.*, 1921, **74,** [N.F. **56**], 17-36).—Mathematical considerations to support a theory.—H. W.

4100. Les lois de la résistance électrique des tissus vivants. M. Philippson (*Bull. acad. roy. Belg.*, 1921, 387-403).—An analysis of the electrical resistance of tissues to high-frequency currents, which must be read in the original (see Abstract No. 765, Vol. VI., p. 116).—R. K. S. L.

APPARATUS AND METHODS

4101. L'égersimètre. Déscription et étude d'un appareil destiné à l'exploration de l'excitabilité électrique des nerfs et des muscles chez l'homme. A. Strohl (*J. de radiol. et d'électrol.*, 1921, **5,** 289-96).—The stimulating circuit is first made, and then broken by means of a falling weight. The apparatus is designed for the investigation of the relation between the total quantity of electricity used and the time required to give a threshold stimulus.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4102. L'utilisation de la lampe à vide à trois électrodes en physiologie et en médecine. M. Philippson (*Soc. roy. sci. méd. natur. Bruxelles*, 1920, Nov. 7, reprint, pp. 4).—A short description of the thermionic valve and its use as an amplifier in electro-biological research.—R. K. S. L.

4103. Apparatus for Air Analysis. A Gas Receiver for sampling Expired Air. C. C. Guthrie (*J. Biol. Chem.*, 1921, **48,** 365-72, 373-8).—Two cheap and simple forms of apparatus for the use of students.—T. A. W.

4104. Eine einfache und schnelle Methode zur Bestimmung der Oberflächenspannung von sehr geringen Flüssigkeitsmengen. R. Brinkman and E. van Dam (*Münch. med.*

Woch., 1921, **68,** 1550).—A simple method of estimating the surface tension of solutions by the aid of a torsion balance and a platinum ring which hangs from it in a horizontal position. The ring is immersed in the solution whose surface tension is to be determined. The force exerted by the solution on the ring is weighed on the balance (K); the solution is removed, and the ring weighed again with a little adherent solution (G). Then $\frac{K-G}{L}$ = surface tension, and L is calculated from the known surface tension of water.—J. H. B.

4105. Beiträge zur Physiologie und Pharmakologie der Blutegelmuskulatur. W. Teschendorf (*Pflüger's Arch.*, 1921, **192,** 135-62).—The cutaneous musculature of the leech is recommended as a useful pharmacological preparation, since it contains no nerve centres, is but slightly affected by changes of osmotic pressure, and responds well to drugs. Many examples are given.—C. L. E.

4106. The Estimation of Amino-Acids of Feeds. T. S. Hamilton, W. B. Nevens, and H. S. Grindley (*J. Biol. Chem.*, 1921, **48,** 249-72).—Amino-acid content of various cattle feeds (oats, corn, cotton-seed meal, etc.) were determined by the Van Slyke method. Better results than those previously published were obtained by removing interfering substances by extraction with suitable solvents.—T. A. W.

4107. A Method for the Separation of Amino-Acids from the Products of Hydrolysis of Proteins and Other Sources. H. W. Buston and S. B. Schryver (*Biochem. J.*, 1921, **15,** 636-42).—A description is given of a "baryta CO_2" method for the isolation in crystalline form of the hydrolytic products of proteins.—J. A. H.

4108. Limitations of the Modified Lewis-Benedict Method of Blood-Sugar Estimation. R. A. Guy (*Biochem. J.*, 1921, **15,** 575-6).—The addition of 0·1 mg. acetone (2 c.c. of a 0·005% solution) to 2 c.c. blood causes an observable colour change. Equal amounts of ethyl acetoacetate cause no change. If the solution is boiled before addition of acetone or acetoacetic acid, much larger amounts may be added without this action. —J. A. H.

4109. Methodik der quantitativen Bilirubinbestimmung im menschlichen Serum. Über die Ehrlich-Pröscher'sche Reaction. J. S. Thannhauser and E. Andersen (*Deutsch. Arch. f. klin. Med.*, 1921, **137,** 179-86).—A discussion of the difficulties of this method and its faults, with some suggestions for improvement.—H. W.

4110. Ein Bilirubinkolorimeter behufs klinischer Bestimmung der Bilirubinmenge im Blute. E. Meulengracht (*Deutsch. Arch. f. klin. Med.*, 1921, 38-46).—Description of the method and the apparatus, and its advantages over other methods.—H. W.

4111. Méthode néphélométrique pour la détermination de l'acide phosphorique et de ses composés contenus dans de petites quantités de sang. W. R. Bloor (*Bull. soc. chim. biol.*, 1921, **3,** 451-75).—Methods for preparing blood (plasma and corpuscles) for nephelometric determination of inorganic phosphates, phospholipoids, and organic phosphates, the sum of which represent the total phosphates, are described in detail. The nephelometer employed is a modified Dubosq colorimeter.—R. K. S. L.

4112. Séparation des protéines du sérum. M. Piettre and A. Vila (*Bull. soc. chim. biol.*, 1921, **3,** 483-89).—The serum is first neutralised by HCl, and then sufficient alcohol or acetone is added to precipitate the proteins alone; the precipitate is then filtered, washed, etc.—R. K. S. L.

4113. Eine einfache und exakte Methode zur direkten quantitativen Bestimmung von Acetaldehyd neben Aceton. W. Stepp and R. Fricke (*Zeit. physiol. Chem.*, 1921, **116,** 293-301).—The aldehyde is determined by the reduction of an ammoniacal silver solution of known strength, and the estimation of the amount of silver left in solution. Acetone is determined, after oxidation of the acetaldehyde, by the ordinary Messinger-Huppert method.—H. W. D.

CHEMICAL

4114. Influence of Electrolytes on the Solution and Precipitation of Casein and Gelatin. J. Loeb and R. F. Loeb (*J. Gen. Physiol.*, 1921, **4,** 187-211).—While in the hydrophobic colloids the precipitating ion has the opposite sign of charge to that of the colloidal particle (Hardy's rule), there is no such relation in the case of the hydrophilic colloids, where high concentration of electrolytes is required. (But how about precipitation of albumin by lanthanum in Mines' experiments ?) The forces which cause hydrophobic casein chloride to go into solution are regulated by the Donnan equilibrium—namely, swelling of particles. Those which act on hydrophilic sodium caseinate are different, and may be those of residual valency. Swelling plays no part here, nor does the Donnan equilibrium. The stability of casein chloride (which only needs low concentration of electrolytes to precipitate) is due to osmotic pressure generated by Donnan equilibrium between casein ions, tending to form aggregates, and thus forcing them apart, together with the potential difference between the surface of a "micellum" and the surrounding medium. Precipitation by salts in this case is due to diminution of osmotic pressure and of potential difference. For "salting out" of hydrophilic colloids like gelatin, sulphates are more efficient than chlorides. In the case of isoelectric gelatin both chlorides and sulphates increase the solubility in low concentrations, but sulphates have the opposite effect in concentrations above $m/32$. There is no adsorption of ions in the precipitation of proteins.—W. M. B.

4115. Anomalous Osmosis. J. Loeb (*J. Gen. Physiol.*, 1921, **4,** 213-26).—Dilute HNO_3 diffuses through a gelatin membrane into a salt solution of the same acid concentration at a rate which is a minimum at the isoelectric point of gelatin, rising with increase of C_H to a maximum, and then decreasing. The potential differences between the salt solutions and the outer solutions were found to give curves similar to the osmosis curves. The difference between the acid concentration on the 2 sides of the membrane, due to the Donnan membrane effect, is one of the sources of the potential difference. Diffusion potentials may be another source. It is suggested that the Donnan "equilibrium" may be one of the factors of the Helmholtz double layer in such experiments.—W. M. B.

4116. Adsorption. A. P. Mathews (*Physiol. Rev.*, 1921, **1,** 553-97).—In addition to a review of the recent literature, the author brings original work forward. Some of the conclusions are: The assumption that adsorption means a physical rather than a chemical force is incorrect; the attempt to bring all processes of adsorption under surface tension has failed, and leads to confusion; there is a close parallelism between the "quantity of cohesion" in a gas or vapour and the amount adsorbed, and the specificity of such adsorptions is due to the varying amounts of cohesion in the gases; the adsorption of carbon monoxide and oxygen by hæmoglobin is due to chemical forces. The whole paper merits careful perusal.—J. A. H.

4117. Origin and Destiny of Cholesterol in the Animal Organism. J. A. Gardner and F. W. Fox (*Proc. Roy. Soc.*, **92B,** 358-67).—An investigation of the intake and output of sterols in 8 normal human subjects on diets, composition of which was known. Details of method of analysis are given. The sterols ingested are cholesterol (free and ester) and traces of phytosterol; the sterols excreted are mainly coprosterol, with smaller amounts of β-cholestanol and cholesterol, and perhaps phytosterol. The average intake and output of sterols precipitable by digitonin is 0·25 and 0·56 respectively, giving a negative daily balance per subject of 0·31 gm. Similar figures for the "unsaponifiable matter" not precipitated by digitonin are 2·2 and 0·38, with a daily positive balance of 1·8 gm. per day per subject. The ratio of average amounts of fæcal sterols precipitable by digitonin to the unsaponifiable matter not so precipitable is from 1 : 0·25 to 1 : 1·18. It is concluded that "there must be some organ in the body capable of synthesising cholesterol."—J. A. H.

4118. Über Cholesterin. A. Windaus (*Zeit. physiol. Chem.*, 1921, **117,** 146-58).—A collection of chemical studies of cholesterol derivatives bearing on the structure of this substance.—H. W. D.

4119. Le phosphore lipoïdique total éthéro-soluble de composes phosphorés autre que les phosphatides. Eliane Le Breton (*Bull. soc. chim. biol.*, 1921, **3,** 539-46).—In an ether extract of dog's liver there are compounds of P (up to 20%) which are not phosphatides.—W. D. H.

4120. Interferometrische Analyse der Immunpräcipitation. R. Doerr and W. Berger (*Biochem. Zeit.*, 1921, **123,** 144-89).—After a simplification of the technique of the interferometer, the authors carried out measurements (*a*) on various mixtures of solutions, some of which reacted chemically and others did not; (*b*) on flocculation by salts of the rare earths in protein solutions; (*c*) on solutions undergoing fermentation. The experience gained enabled the authors to examine the specific protein precipitation produced by the antigen-antibody reaction. Up to the moment of flocculation there is no change of refraction, and hence the hypothesis of fermentative hydrolysis of antigens by antibodies is deprived of its main support. Immune precipitation and anaphylaxis are pure physical processes.—H. K.

4121. Preparation of "Peptone." M. B. Soparkar (*Rep. Bombay Bact. Lab.*, 1918, 9-10; *Exp. Stat. Rec.*, **43,** 502).—Casein from skimmed milk is digested with a pancreatic preparation from goats for a few days, then boiled, evaporated to dryness, and powdered. It was found to be a good substitute for Witte's peptone.—W. D. H. (*Chem. Abstr.*).

4122. The Relation of Hydrogen-Ion Concentration to the Heat Coagulation of Proteins in Swiss Cheese Whey. Y. Okuda and H. F. Zoller (*J. Ind. Eng. Chem.*, 1921, **13,** 515-9).—The optimum reaction for the heat coagulation of the proteins of the whey is about P_H 4·5. When whey is acidulated with any of the acids investigated (HCl, $HC_2H_3O_2$, $HC_3H_5O_3$) to P_H 4·5 and then heated at 98° for 45 minutes, about 57% of the total nitrogen is removed in the curd. The remainder N is mainly non-protein.—W. D. H. (*Chem. Abstr.*).

4123. Über die Desaminoproteine. J. Herzig and H. Lieb (*Zeit. physiol. Chem.*, 1921, **117,** 1-12). See Herzig (*ibid.*, 1920, **111,** 223).—Desaminoglutin can be methylated to about the same extent as glutin (? gelatin) itself. Moreover, the desamino-protein gives similar figures for amino-N as the normal protein when examined by Van Slyke's and by Sörensen's methods. Similar results have been obtained with ovalbumin, casein, gliadin, and their corresponding desamino-derivatives. These rather surprising results may possibly be explained by assuming that the proteins are partially hydrolysed with appearance of new NH_2 groups in the process of preparing the desamino-compounds, but the significance of the results of the above-mentioned methods applied to the examination of the characteristic groups occurring in proteins is certainly obscure.—H. W. D.

4124. Über Bildung von Mercaptursäure im Eiweissminimum. J. Kapfhammer (*Zeit. physiol. Chem.*, 1921, **116,** 302-7).—When bromobenzene is given to a dog simultaneously with protein, it is excreted as *p*-bromophenylmercapturic acid. But if administered to a dog receiving no protein, none of this acid appears in the urine. If, however, cysteine is injected subcutaneously during the ingestion of the bromobenzene, the mercapturic acid is excreted. Thus it appears that the cysteine resulting from tissue breakdown is not available for the synthesis of the mercapturic acid. In what form bromobenzene is excreted when there is no available cysteine is not stated.—H. W. D.

4125. Determination of the Monoamino-Acids in the Hydrolytic Cleavage Products of Lactalbumin. D. B. Jones and C. O. Johns (*J. Biol. Chem.*, 1921, **48,** 347-60).—A study by modern methods. 0·37 glycine, 1·76 serine, and at least 10% of hydroxyglutamic acid were found, acids which have not previously been determined in lactalbumin. 9·3% of aspartic acid was also obtained, which is 9 times the amount previously recorded.—T. A. W.

4126. Brenztraubensäure als Zwischenprodukt der alkoholischen Zuckerspaltung. M. v. Grab (*Biochem. Zeit.*, 1921, **123,** 69-89).—Apart from the experiments of Fernbach and Schoen (*Compt. rend.*, 1920, **170,** 764) with an atypical yeast, pyruvic acid has never been isolated as an intermediate product in a typical yeast fermentation. By use of a new fixative, β-naphthylamine, the author has isolated the condensation product of pyruvic acid and β-naphthylamine—namely, α-methyl-β-naphthocinchoninic acid from the interaction of press juice and glucose.—H. K.

4127. Separation of β-Aminoethyl Alcohol from Choline. E. Fourneau and A. Gonzalez (*Anales soc. espan. fis. quim.*, 1921, **19,** 151-5).—The two bases were obtained from a phosphatide preparation from eggs. Their hydrochlorides differ in solubilities, and so can be separated. The method is given in detail.—W. D. H. (*Chem. Abstr.*).

4128. Über Harnsäuresynthese im menschlichen Organismus. G. Kollmann (*Biochem. Zeit.*, 1921, **123,** 235-44).—Fifty days' observation of a 26-year-old girl on a standard diet poor in purines resulted in increase of weight of 4 kg. and an excretion of 15 gm. of uric acid in excess of the quantity furnished by the food. A purine synthesis is postulated, but requires further confirmation.—H. K.

4129. Über die Einwirkung von Diazomethan auf Ureide und Harnsäure. J. Herzig (*Zeit. physiol. Chem.*, 1921, **117,** 13-27).—The author considers that the free amino-groups of proteins do not suffice to account for the N-methyl derivatives obtainable, and thinks that the CO.NH (CN.OH) group is particularly liable to yield both O- and N-methyl compounds. This view is experimentally supported by the ease of methylation of analogous groups in ureides and uric acid.—H. W. D.

4130. Zur Chemie der Homogentisinsäure—II. and III. C. Th. Mörner (*Zeit. physiol. Chem.*, 1921, **117,** 67-84, 85-90).—II. Distillation of homogentisic acid with concentrated ferric chloride yields a glittering gold coloured product crystallising in leaflets. Contrary to the usual statements, no quinone-like smell is developed during the distillation. III. Crystal form and other constants were investigated.—H. W. D.

ENZYMES

4131. Investigation of Amylases and Related Enzymes. H. C. Sherman. (*Carnegie Inst. Washington Yearbook*, 1919, **18,** 328-30).—A neutral solution of Na aspartate corrected the abnormally low results obtained by the action of purified pancreatic amylase upon potato starch which had previously been purified by washing with dilute alkali and water. The aspartate also accelerated the hydrolysis of other starches by pancreatic amylase, malt amylase, pancreatin, or by saliva, but had no such action on their hydrolysis by a simple extract of malt, or by the amylase of *Aspergillus oryzæ*. Asparagine caused similar results. The activating effect of aspartic acid is not due to a change in the H-ion concentration, nor to the Na ion, but is, in a sense, specific.—W. D. H. (*Chem. Abstr.*).

4132. Über Vergiftungserscheinungen an Amylasen. U. Olsson (*Zeit. physiol. Chem.*, 1921, **117,** 91-145).—The optimum acidity for salivary amylase is P_H=6·4. The poisoning of the amylases of saliva and malt by various salts of heavy metals and other reagents is investigated. Salivary amylase is less sensitive to poisons than malt amylase, which points to a difference between the 2 enzymes. Dialysis of salivary amylase solutions removes an activator, which appears to be mainly sodium chloride. It is suggested that the poisonous effect of minute amounts of salts of the heavy metals may be applied to their analytical determination.—H. W. D.

PHYSIOLOGY OF INVERTEBRATES

4133. Cellular Multiplication. I. Of Infusoria. II. Influence of Mutual Contiguity and the Part Played by the "X-Substance." T. B. Robertson (*Biochem. J.*, 1921, **15,** 595-611, 612-9).—I. The rate of multiplication of single infusoria falls off, at first rapidly, then more slowly with increasing age of the parent culture; this loss of reproductive capacity is not due to accumulation of retarding substances, but to periods at a low nutritive level. The final number of infusoria in a culture depends on the number of bacteria available for food, and the accelerative effect of bacterised infusions on reproduction rate is due to the production therefrom of a hypothetical soluble, non-volatile, thermostable "X-substance." The multiplication of infusoria is of autocatalytic character due to contiguity of cells in limited space. This contiguity affords protection against high temperatures. II. When 2 individuals from the same parent stock are introduced into the same drop of medium, there are produced up to 8 times as many individuals in 24 hours as are formed from 1 individual. This effect is not due to bacterial content of individuals or media, nor to conjugation, and the author takes this as demonstrating the truth (in this instance) of the autocatalytic theory of growth. The effect of contiguity is exhibited only in the presence of soluble (bacterial) metabolic products, probably "X-substance," which, though itself not an accelerator of multiplication, is converted by animal cells into an accelerative agent, or facilitates the production of an accelerative agent. The possibility is indicated of "the existence of an accessory food-stuff which is essential, because it enables the production of autogenous catalysors of cell multiplication by the animal cells themselves."—J. A. H.

4134. Sur la composition chimique des astéries. G. Hinard and R. Fillon (*Compt. rend.*, 1921, **173,** 935-7).—A meal prepared from starfish can be used as a nitrogenous calcareous manure, and for the feeding of fowls. The mineral matter is chiefly $CaCO_3$. No carbohydrate has been found, but there is about 6% of fat. This fat, after purification, gives a clear, yellow-brown oil, which appears to be capable of being applied to the same purposes as fish oil.—Ha. W.

4135. Manganese in Mollusca. A. E. Boycott (*Naturalist*, 1917, 11-8, 69-73).—The soft parts of 56 species of British Mollusca were analysed. Results are expressed in parts per 10,000 of dry material. The amounts found range from less than 0·5 up to 270 parts in *Limax arborum*. Most of the Mn seems to be localised in liver and skin. Some species tend to accumulate Mn from their food and surroundings, but local conditions are able to cause considerable variations. Analyses were made for Mn in plants which snails might eat, yielding a range from none in the potato and less than 0·2 in ash leaves up to several hundred in green slime from streams and 690 parts in a moss from a culvert. Water plants in general contain more than land plants, and lower plants, except fungi, more than higher ones.—W. D. H. (*Chem. Abstr.*).

4136. Über die Extractstoffe von Mytilus edulis—I. D. Ackermann (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 67-76).—Arginine, neosine, methyl-pyridyl, ammonium hydroxide, and crangonine are present. Arginine in invertebrates has the rôle of creatinine in vertebrates (see Abstract No. 3279, Vol. VI., p. 479).—H. W.

4137. Stereotropic Orientation of the Tube Feet of Starfish (Asterias), and its Inhibition by Light. A. R. Moore (*J. Gen. Physiol.*, 1921, **4,** 163-9).—Contact of the side of a ray with a foreign object causes a retraction of the tube feet, followed by a protrusion towards the stimulated area. When the tube feet come into contact with the foreign surface they adhere tightly, but can be caused to release their hold by the impact of a beam of light. A certain minimal intensity is required. A value of stereotropism in terms of light can thus be obtained. It amounts to between 250 and 350 candle-meter seconds. The Bunsen-Roscoe law holds.—W. M. B.

4138. Fertilisation. X. The Effect of Copper Salts on Fertilisation in Arbacia. F. R. Lillie (*Biol. Bull.*, 1921, **41,** No. 3).—Copper salts in low concentration (1 part in

500,000 parts of sea-water) completely inhibit fertilisation in Arbacia, although the spermatozoa remain motile. The effect is reversible, and is thus attributed to inactivation of a substance contained in the egg, not to its destruction. If the eggs are first inseminated in sea-water, they can be transferred after a few seconds to copper solutions without detriment. The substance in question has thus been transformed in a very short time. It passes from an inactive to an active phase. The secretions of eggs in sea-water contain a substance that binds copper in the same manner as unfertilised eggs, and will thus protect against the inhibiting action of copper on fertilisation. This substance is presumed to be the fertilisin of earlier studies, and to be identical with the activable substance of the egg. Gum-arabic and gelatin will likewise protect the fertilisation of eggs against copper by binding it. Mercuric chloride has a different action from copper chloride, inhibiting the later processes of fertilisation much more than the initial one. On the hypothesis that activation of the egg is due to activation of a ferment, the data may be understood in the sense that copper is more powerful than mercury in its action on the inactivated ferment, but that mercury is more powerful than copper on the activated ferment.—W. D. H. (*W. I.*).

4139. Phagocytosis and Clotting in the Perivisceral Fluid of Arbacia. J. E. Kindred (*Biol. Bull.*, 1921, **41,** No. 3).—Phagocytosis in the perivisceral fluid of Arbacia is carried on by the leucocytes alone. These cells possess membranous processes similar to those of the leucocytes of Asterias, and are the smallest and most numerous of the amœbocytes. The leucocytes have a long period of activity. They form the basis of the clot in the perivisceral fluid. They show an alkaline reaction when treated with neutral red in sea-water, but are not affected by weak solutions of intravitam stains introduced into the perivisceral cavity.—W. D. H. (*W. I.*).

4140. Sulla presenza di depositi uratici nel tessuto adiposo dei termitidi. C. Jucci (*Atti d. r. accad. naz. dei Lincei*, 1921, **30,** 92-5).—In many termites deposits of urates are found in the adipose tissue.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4141. Chemotropism in House Fly. E. R. Speyer (*Ann. Appl. Biol.*, 1920, **7,** 124-40; *Exp. Stat. Rec.*, **44,** 458-9).—Essential oils are unattractive. The repellent action varies with different oils.—W. D. H. (*Chem. Abstr.*).

4142. The Relation of Respiration to Rhythm in the Cardiac Ganglion of Limulus polyphemus. W. E. Garrey (*J. Gen. Physiol.*, 1921, **4,** 149-56).—A variety of agents which stimulate the cardiac ganglion and increase the rate of heart beat produce a similar increase in the rate of production of CO_2 by the nerve cells of the ganglion. Such agents are electrical stimulation, stretching, action of alcohol, sodium chloride, adrenaline, and rise of temperature.—W. M. B.

4143. Oxygen Consumption—V. A. E. Galigher (*Amer. J. Physiol.*, 1921, **58,** 301-7).—The oxygen consumption by Nereis is decreased by KCN in *m*/5,000, and more markedly in regions where the normal oxygen consumption is greater. Thus the gradient is abolished.—W. M. B.

4144. Constitution de l'œuf de Sabellaria alveolata, L. E. Fauré-Fremiet (*Compt. rend.*, 1921, **173,** 1023-6).—The egg contains a small quantity of glycogen, proteins, and lipoids in intimate union. A large proportion of the protein exists as a reserve in the form of globules of " vitelline," some of which are probably nucleoproteins. The fat exists as neutral fats, soaps, and phosphatides.—Ha. W.

4145. Les réactions phototropiques de quelques animaux marins. M. Goldsmith (*Compt. rend.*, 1921, **173,** 1026-8).—The animals used were *Convoluta roscoffensis*, *Mysis chamælœon*, and others, all of which congregate in masses. The experiments showed that the movements of the animals were very varied, and such as to bring them into the best lighted region, and here they placed themselves in all possible positions without any regard to the angle which the axis of the body would form with the direction of the rays of light.—Ha. W.

CELLS AND TISSUES

4146. Über Oogenese des Dendrocœlum lacteum. II. Die Längsconjugation der Chromosomen. J. Gelei (*Arch. f. Zellforsch.*, 1921, **16,** 88-169).—Extensive investigations of cytological interest.—H. W.

4147. Geschlechtschromosomen Untersuchungen an Psychiden. II. Die Chromosomenzyklen von Fumea casta und Taläporia tubulosa. "Non-Disjunction" der Geschlechtschromosomen. J. Seiler (*Arch. f. Zellforsch.*, 1921, **16,** 19-45).—Details of purely cytological interest.—H. W.

4148. The Selective Absorption of Potassium by Animal Cells—II. P. H. Mitchell, J. W. Wilson, and R. E. Stanton (*J. Gen. Physiol.*, 1921, **4,** 141-8).—Frog muscles, if caused to contract, will take up rubidium and cæsium from Ringer's solution in which K has been replaced by these elements. They are not washed out during a resting state, neither are they taken up during rest. The increased permeability of cells in activity is thus shown. Rats on diet in which K was replaced by rubidium or cæsium died after 10 to 17 days with symptoms of tetanic spasms, etc. Muscle, heart, liver, kidney, spleen, and lungs contained rubidium and cæsium. It is held that the physiological effects of K are related to its electronic structure, and possibly to its comparative migration velocity, which is itself a function of its electronic structure.—W. M. B.

4149. Mitochondria in the Human Amnion. L. A. Emge (*Anat. Rec.*, 1921, **22,** No. 5).—Mitochondria occur in the cells of the human amnion at all stages. Their staining affinity is less than in other tissues.—W. D. H. (*W. I.*).

4150. A Comparison of an Amœba, Vahlkampfia patuxent, with Tissue Culture Cells. Mary J. Hogue (*J. Exp. Zool.*, 1922, **35,** No. 1).—The amœbæ were introduced into tissue cultures of chick tissues. The amœbæ were 4 times as sensitive to vital stains as the tissue culture cells. Melanin granules from retina were taken in by both, and were extruded without being digested by the amœbæ. The tissue cells died without having extruded the pigment granules. Motion is taken as a criterion of life for the amœba, while for the tissue culture cell its reaction to vital stains has been used.—W. D. H. (*W. I.*).

4151. Erythrocytes, with Special Reference to Reticulum, Polychromatophilia, and Mitochondria. J. A. Key (*Arch. Int. Med.*, 1921, **28,** 511-49).—Young erythrocytes differ from mature forms in having a lower specific gravity and a tendency to adhere to foreign bodies; they are characterised by a basophil substance which, when stained, gives pictures of polychromatophilia. The presence of mitochondria in young red cells has not been demonstrated.—J. H. B.

4152. Hæmatophagy. H. M. Woodcock (*J. Roy. Army Med. Corps*, Nov-Dec., 1921; *Lancet*, 1921, ii., 1385).—This name is given to the ingestion of red blood-cells by other cells. It is believed to be widespread, and that the bodies of Kurloff, Negri, and other pathological appearances are all various stages in hæmatophagy. This conclusion is based on microscopic study only; experiments are lacking.—W. D. H.

4153. I. Sulle cellule giganti da corpi estranei. D. Cattaneo (*Arch. per le sc. med.*, 1920, **43,** 202-16). **II. Contributo allo studio delle cellule giganti da corpi extranei per mezzo della colorazione vitale.** L. Torraca (*Hæmatologica*, 1920, **1,** 156-95).—I. The formation of giant cells is connected with the physical and chemical properties of the foreign body used for their production. Foreign body giant cells originate at first from the cytoplasmic fusion of mononuclear basophil wandering cells; also from amitotic and mitotic divisions of their nuclei. They may remain unaltered for a long time in the site of formation, and do not take part in production of ordinary connective tissue. II. Foreign body giant cells may be formed from cells of different kinds, such as typical histiocytes, cells similar to fibroblasts, fat cells.—C. d. F.

4154. Dynamics of Histogenesis—VIII. E. J. Carey (*Amer. J. Physiol.*, 1921, **58,** 182-94).—Apparently this merely repeats No. VII. in the series (Abstract No. 3298, Vol. VI., p. 482).—W. D. H.

4155. Ricerche elettrofisiologiche. I. La polarità delle correnti elettriche consecutive alle lesioni nei girini. II. Il decremento delle correnti di riposo e delle correnti di demarcazione nei muscoli. G. Viale (*Arch. di Fisiol.*, 1921, **19,** 243-7, 249-54).—I. The currents observed after lesions of tadpoles' tissues are only a manifestation of the law that in normal conditions of vascularisation and innervation altered tissues are electrically positive. This agrees with the view of the author and Herlitzka that the inner portion of the cells is likewise electrically positive. II. Living muscle is always electrically positive, in opposition to the tendon, which is negative. After death the muscle is negative, while the tendon is positive.—C. d. F.

4156. Endothelial Reactions. V. The Endothelium in the Healing of Aseptic Wounds in the Omentum of Rabbits. N. C. Foot (*J. Exp. Med.*, 1921, **34,** 625-42).—Proliferation may result in production of new vessels, phagocytic endotheliocytes, or of cells indistinguishable from fibroblasts; the last 2 can be identified by their selective absorption of "colloidal carbon" (indian ink). The 3 types are interchangeable. Collagen fibres are formed, independently of cellular activity, from fibrin or some similar substance.—C. L. E.

4157. Über eine bisher unbekannte Form einer Kernveränderung an Zellen in der Umgebung von Plasmazellen. E. Meiroisky (*Arch. f. Dermat. u. Syph.*, 1921, **131,** 226-30).—A description of refractive non-staining bodies occurring near the nuclei of connective tissue cells. These cells are always found to be in close association with plasma cells, but their nature is not clear.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4158. Age and Multiplication of Fibroblasts. A. Carrel and A. H. Ebeling (*J. Exp. Med.*, 1921, **34,** 599-623).—The rate of multiplication of fibroblasts varies inversely as the age of the animal from which the plasma used for cultivation was derived. The differences are due, not to the decrease of an accelerating factor in the older plasmas, but to the increase of an inhibiting factor.—C. L. E.

4159. The Factor determining the Spread of Red Marrow during Anæmia. P. D. McMaster and H. Haessler (*J. Exp. Med.*, 1921, **34,** 579-91).—The spread is due to the presence in the body of hæmoglobin, or its precursors, in excess of the amount which can be utilised by the marrow already existing. The widespread "currant jelly" marrow of pernicious anæmia is an example of this, while the pale restricted marrow in chronic anæmia, due to repeated hæmorrhages, is associated with depletion of the constitutents necessary for pigment production.—C. L. E.

4160. Über den Wert der Nilblaumethode für die Darstellung der Fettsubstanzen und den Einfluss einer längeren Formalinfixierung auf den Ausfall der Färbung. E. Boeminghaus (*Beitr. z. path. Anat. u. z. allg. Path.*, 1920, **67,** 533-8).—The affinity of Nile blue sulphate for fat is small. Oleic acid and its esters are the most stainable. Oleic acid stains blue, its esters red. The staining manner of fats cannot be used to identify them. An intense blue, however, proves the presence of free oleic acid. Neutral fat stains red in tissues fixed in formalin.—C. d. F.

4161. The Circulatory System in Bone. J. S. Foote (*Smithsonian Miscellaneous Collections*, Washington, 1921, **72,** No. 10; reprint, pp. 20).—Comparative histology. —C. L. E.

4162. Sur la morphogénèse des os longs par la méthode des greffes embryonnaires. R. Simon and M. Aron (*Compt. rend. soc. biol.*, 1921, **85,** 943-6).—The authors have grafted bones from a guinea-pig fœtus into the subcutaneous tissue of the back of a guinea-pig, and observed their growth. They have shown that when epiphyseal cartilage proliferates in an abnormal direction, periosteal bone is stimulated to excessive growth. For this to take place, the diaphysis must maintain connection with both epiphyses; the isolated diaphysis or the diaphysis only connected with one epiphysis remains unchanged; the diaphysis connected with both epiphyses, only one of which is proliferating, develops abnormally.—J. H. B.

MUSCLE AND NERVE. REFLEX ACTION

4163. L'activité statique du muscle. Origine historique de cette notion. R. Mourgue (*Encéphale*, 1921, **16,** 297-304).—An account of the history of the idea of muscle tone. —T. R. P. (*Ber. ü. d. ges. Physiol.*).

4164. Beiträge zur Lehre vom Muskeltonus. II. Zustand und Innervation der Muskeln der vorderen Extremitäten des Frosches während der Umklammerung. R. H. Kahn (*Pflüger's Arch.*, 1921, **192,** 93-114; see Abstract No. 2506, Vol. V., p. 396).—In addition to a confirmation of former findings, the experiments indicate that reflex augmentation of the clasp reflex can be produced; this, unlike the tonic state, is accompanied by tetanic action currents in the muscle. The normal path of the efferent impulses is by the spinal nerves, especially the 3rd; section of these abolishes the reflex, while section of the sympathetic (operation described) is without effect. The tonic contraction is removed by curare in doses sufficient to paralyse other muscles. Adrenaline, except in large doses, has no effect. Physostigmine in small doses facilitates the reflex excitability, but has no effect on the tonic state itself. Atropine has no effect.—C. L. E.

4165. Der Klammerreflex nach Sympathicusexstirpation. Ein Beitrag zur Frage der tonischen Innervation. E. A. Spiegel and E. Sternschein (*Pflüger's Arch.*, 1921, **192,** 115-7).—The authors agree with the author of the preceding abstract, that removal of the sympathetics to the frog's fore-limb leaves this tonic reflex unimpaired. —C. L. E.

4166. Zur Frage des Rhythmus der Willkürinnervation des menschlichen Muskels. E. Bass and W. Trendelenburg (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 113-20, 121-30).—The difference in the curves of the action currents of muscles, excited indirectly or voluntarily, show that the muscle follows all impulses which come from the central nervous system, even if they are irregular. Two parts of the same muscle, separately investigated in the same time, show the greatest conformity in their action currents. The first paper describes the method used.—H. W.

4167. The Static or Posture System and its Relation to Postural Hypertonic States of the Skeletal Muscles, Spasticity, Rigidity, and Tonic Spasm. J. R. Hunt (*Neurol. Bull.*, 1921, **3,** 207).—The efferent system anatomically and functionally is dual—viz., static and kinetic. Normally these systems co-operate, but in disease they may dissociate. Both movement and posture may be divided into reflex, automatic associated, and isolated synergic types, and underlying these three types of motor activity are three fundamental divisions of the nervous sytem: (1) *The segmental nervous system ;* (2) *the palæo-encephalon ;* (3) *the neo-encephalon.* Each motor system is again divided into *neo-kinetic* and *palæo-kinetic*, and *neo-* and *palæo-static.* The reviewer (Dr. Walshe) states that " the paper contains so many unfounded anatomical and physiological assumptions that an adequate analysis of it is not possible in a small compass."—J. A. H. (*Med. Sci.*).

4168. Influence du sympathique sur la sensibilité. A. Tournay (*Compt. rend.*, 1921, **173,** 939-42).—If the heel of a dog, either intact or with the nerves of both thighs cut, is burnt, the animal shows weakening of the muscles of the corresponding leg, holds up the affected paw, and walks on 3 legs. The same occurs if the sympathetic is resected on the same side previously, and there is also noted an exaltation of sensitiveness on the side of the resection. If, however, after section of both sciatics, resection of the abdominal sympathetic on one side, and section of the 2 internal saphenous nerves, a cut is also made across the aponeurotic expansion extending from the posterior muscles of the thigh to the tendo Achillis, no asymmetry of attitude or of sensitiveness is observed. It is, therefore, by means of these nerve paths descending from the thigh in the aponeurotic expansion that the influence of resection of the sympathetic is shown in the augmentation of sensitiveness and the raising of the leg.—Ha. W.

4169. Physikalisch-chemische Untersuchungen am Nervensystem. I. Quellung und Doppelbrechung der Markscheide. II. Der Einfluss der Narkotica auf die Anisotropie des Nervenmarks. E. A. Spiegel (*Pflüger's Arch.*, 1921, **192,** 225, 240-54).—I. Double refraction is a property of living nerve, and changes in it indicate alterations in the pressures within the myelin sheath; normally the direction of this pressure is at right angles to the axis cylinder. Swelling caused by acids or water reduce anisotropy. II. Lipoid soluble narcotics reversibly lower anisotropy.—C. L. E.

4170. Der spezifische Widerstand des Nerven und seine Beziehung zur Erregungsleitung. P. Broemser (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 49-66).—A method is described by which it is possible to measure at the same time the specific resistance in the longitudinal direction and in transverse section of an isolated nerve. The specific resistance of the frog's sciatic nerve increases in the longitudinal direction with decrease and loss of function. The specific resistance increases during ether narcosis.—H. W.

4171. Über die sympathische Innervation der Krötenhaut. E. Th. Brücke (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 99-112).—For the determination of the "sympathetic dermatomes," the method used was the excitation of the ventral spinal roots and observing the secretion of the skin glands.—H. W.

4172. Anatomical and Physiological Studies of the Eighth Nerve. E. Sachs and B. Y. Alvis (*Arch. Neurol. and Psychiat.*, 1921, **6,** 119).—Anatomical conclusions are: (1) No fibres run directly from the semicircular canals to the nuclei of the vestibular nerve; (2) very few fibres run forward from Deiter's nucleus; (3) no fibres pass from this nucleus to the lateral lobes of the cerebellum; (4) some fibres from Deiter's nucleus end in the posterior corpus quadrigeminum of the same side; (5) all vestibular nerve fibres end in the vestibular nuclei or in the roof nuclei. Physiological conclusions are: (1) The only constant and essential symptoms of eighth nerve section or of labyrinth destruction are nystagmus and deviation of the homolateral eye downwards and outwards; (2) the so-called cerebellar attitude of the head is due to involvement of the middle cerebellar peduncle; (3) circus movements, rolling movements, ataxia, swinging and abnormal attitudes of the head are due to lesions of cerebellar nuclei or peduncles. —J. A. H. (*Med. Sci.*).

4173. Chronaxie normale du nerf facial et des muscles de la face chez l'homme. Leur classification fonctionnelle par la chronaxie. G. Bourguignon and A. Tupa (*Compt. rend. soc. biol.*, 1921, **85,** 982-4).—The muscles of the face have a chronaxie which is, in the case of any muscle, one of two values, the one value being greater than the other. Those with the greater chronaxie raise the features, those with the lesser depress them. —J. H. B.

4174. Sull' ipertrofia delle cellule dei gangli spinali che innervando la coda rigenerata della Lacerta muralis. T. Terni (*Giorn. d. r. acc. med.*, Torino, 1920, **83,** 131).—In turtles the size of the spinal ganglion cells is related to the length and number of their processes. In the present paper the regenerated tail of the lizard was examined. This is normal in appearance and in its segmental musculature. It is, however, supplied with nerves which grow out from the nerve stumps of the old tail. The cells in the spinal ganglia involved grow larger, and may reach 5 times the normal size. The size is greatest when the part supplied is at the end of the tail—that is, farthest off. This is regarded as due to an "exceptional morphogenetic stimulus." It is, however, essentially similar to the hypertrophy of a motor nerve when rebuilding a destroyed nerve path, as described by da Fano in 1908. Da Fano, who reviews the present article, does not regard the assumption of an exceptional morphogenetic stimulus as necessary. —W. D. H. (*Med. Sci.*).

4175. A Proprioceptive Reflex in the Spinal Frog. K. Sassa (*Brain*, 1921, **44,** 308-11). —A slight quick pull on the semitendinosus tendon, a knee flexor, evokes a twitch-like reflex contraction, which tends to repeat itself under suitable stretching of the muscle, and may become a clonus with rate of about 4-5 per second. The extensor muscles do not yield such reflexes in the frog, the postural tonus being flexor.—C. S. S.

4176. (1) Observations on Reflex Responses to the Rhythmical Stimulation in the Frog. (2) On the Effects of Constant Galvanic Currents upon the Mammalian Nerve-Muscle and Reflex Preparations. K. Sassa (*Proc. Roy. Soc.*, 1921, **92B,** 328-41, 341-54).—(1) A study of the relation between the frequency and intensity of stimulation and the resulting reflex reactions. It was found that there is an optimal intensity when the rate of stimulation is rapid, but not at moderate rates. There is also an optimal rate for any given intensity. The reflex contraction evoked at optimal rate of excitation is often nearly as powerful as the direct one obtained by similar stimulation, especially in the first period of contraction. (2) A study of the reflex effects resulting from stimulation by constant galvanic currents applied to an afferent nerve of the hind limb. The main points of enquiry have been: (1) The relation between reflex excitation and inhibition of the decerebrate tonus of the vasto-crureus; (2) whether the " excitation formula " (Pflüger's law) holds good in mammalian afferent nerves; and (3) whether there is continuous excitation during the passage of the current through an afferent nerve.—*Author's Abstract.*

4177. Afferent Paths for Visceral Reflexes. S. W. Ranson (*Physiol. Rev.*, 1921, **1,** 477-522).—J. A. H.

CENTRAL NERVOUS SYSTEM

4178. Über den Einfluss der Grosshirnhemisphären, des Mittel- und Zwischenhirns auf die vestibularen Reaktionsbewegungen. J. Rothfeld (*Pflüger's Arch.*, 1921, **192,** 272-304).—In rabbits the cerebral hemispheres exercise no influence over the vestibular reactions. Lesions of the brain stem produce effects which are primarily on the head movement reactions; of these, lesions of corpus striatum and anterior part of thalamus produce quick nystagmus, lesions of the posterior part of the thalamus produce slow nystagmus, and lesions of the midbrain produce a turning of the head to the sound side with loss of nystagmus. After the operated animals have been spun round, they are unable to stand if the head reaction to rotation is absent; such fall reactions are independent of nystagmus, but dependent on the centre for vestibular head rotation. Vestibular head reactions are the ones that determine all the other vestibular reactions.—C. L. E.

4179. Contributo alla istologia del midollo spinale nel preparato nervoso centrale di bufo. E. Sereni (*Arch. di Fisiol.*, 1921, **19,** 287-97).—In Baglioni's surviving preparation of central nervous system no change was seen in the Nissl substance of the anterior horn cells (lumbar region), but the nuclei and nucleoli of the same cells appeared enlarged, often excentrically situated, and sometimes deformed.—C. d. F.

4180. The Zinc and Copper Content of the Human Brain. M. Bodansky (*J. Biol. Chem.*, 1921, **48,** 361-4).—Copper and zinc were found in 4 adult brains: 5 to 15 mg. Zn and 3·6 to 6·8 mg. Cu per 1,000 g. of brain. Both were found in slightly higher amounts in the brain of a fœtus (5 months).—T. A. W.

SPECIAL SENSES

4181. Perception of Colours and Movements with Foveal and Peripheral Regions of Retina. P. F. Swindle (*Amer. J. Physiol. Optics*, 1921 (?), **2,** 204-20).—For both normal and colour-blind people, the more carefully a coloured paper is fixated the sooner it disappears for all regions of the retina. Individuals for whom a given colour disappears very soon when fixated either foveally or peripherally are colour-blind in the same sense as the majority of people are colour-blind—at the peripheral retina primarily. Motion and distance are perceived less accurately and under-estimated more with the peripheral than with the foveal regions of the retina.—C. L. E.

4182. Foveal Dark Adaptation. S. Hecht (*J. Gen. Physiol.*, 1921, **4,** 113-39).—A new procedure is described, avoiding sources of error of previous methods. In the fovea, dark adaptation proceeds at a very rapid rate during the first few seconds, being nearly complete in 30 seconds, and practically at an end in 10 minutes. The results are corrected for the changes in the area of the pupil. If it is assumed that the photochemical effect of the light is a linear function of its intensity, the dark adaptation of the fovea follows the course of a bimolecular reaction. This means that there are two decomposition products, that they disappear by recombination to the original substance, and that the concentration of these products must be increased by a definite fraction to produce a visual effect. Thus the basis of light perception is a reversible photochemical reaction of which the "dark" reaction is bimolecular, and dark adaptation follows this latter reaction. Light adaptation is the shifting of the stationary state to a fresh equilibrium towards the "dark" side of the reaction.—W. M. B.

4183. Histogenesis of the Visual Cells in Amblystoma. S. R. Detwiler and H. Laurens (*J. Comp. Neurol.*, 1921, **33,** No. 5).—The initial stage in the development of the visual cell is the production of a protoplasmic bud and a clear achromatic globule from the cells of the external nuclear layer. The globule, which becomes the paraboloid of the inner segment, appears to be of cytoplasmic, and not of nuclear, origin. In early stages of the visual cells masses of deeply staining granules are seen in iron hæmatoxylin preparations. These granules contribute mainly to the formation of the ellipsoid of the inner segment and to the granular material of the outer segment. There is no evidence that they are products of pigment ingested from the epithelial layer. They may represent transformation products of mitochondria. In early stages the visual cells are all cone-like. Rods and cones are later differentiated from the primitive visual cells. Rods do not appear until relatively late. Double cones appear early in development. The absence of mitotic figures at this time suggests that they are formed from the fusion of single elements rather than from division.—W. D. H. (*W. I.*).

4184. Changes in the Visual Organs correlated with the Adoption of Arboreal Life and with the Assumption of the Erect Posture. E. T. Collins (*Trans. Ophth. Soc.*, 1921, **41,** reprint, 90 pp.).—This Bowman lecture forms most interesting reading. A speculative article of this kind does not lend itself to abstraction. The title and the concluding remarks quoted below will lead those interested to read the arguments. "I would claim that the changes in the visual organs of mammals, produced by the adoption of arboreal life, increased both the range and accuracy of their powers of observation for natural phenomena. It was in this way that the portal became opened for the evolution of the mental faculties of memory and inference—faculties that enabled man's anthropoid ancestors on descent from the trees to subdue their foes, to become successful hunters, and to adopt an omnivorous diet."—W. D. H.

4185. Loss of Pupil Reflex to Light restored by Sleep. A. Garvie (*Lancet*, 1921, ii., 1374).—This occurred in a child æt. 4½; the normal reflex was absent for 6 wakeful days. Sleep then led to restoration. The diminished blood-supply to the brain during sleep is supposed to have lessened pressure on the nerve.—W. D. H.

4186. Minimum Sound Energy for Audition. F. W. Kranz (*Phys. Rev.*, 1921, **17,** 384).—A redetermination which shows that the energy minimum for hearing is much smaller than has been supposed.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4187. L'audizione nei neonati. O. Waltan (*Policlinico sez. prat.*, 1921, **28,** 1010-2).—From a study of the reaction of newly-born children to a sudden shrill sound it is concluded that they do not use the cochlea, but earlier developed portions of the vestibular apparatus, for appreciation of the sound.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4188. La protection contre les vibrations sonores. A. Marage (*Compt. rend.*, 1921, **173,** 1016-9).—The ear may be protected from the fatiguing effects of disagreeable sounds by insulating bodies, by modification of the source of sound, and by modification of the ear. Methods of insulation are impracticable. The source of sound (*e.g.*, motor horn) may be modified by making it give a deep tone. For the individual, however,

it is the ear itself which must be modified, but it is useless to close the external meatus, for then the pulse is heard, and this becomes more fatiguing than external sounds. The author proposes to suppress the noise of a sewing-machine or typewriter, for example, by introducing a new note of slightly greater intensity but different timbre. This can be obtained by a small electric motor.—Ha. W.

4189. Mischungsgleichungen im Gebiete des Geschmacksinns. E. v. Skramlik (*Zeit. f. Sinnesphysiol.*, 1921, **53,** 36-78).—Solutions of various inorganic salts may be analysed as having a taste composed of salt, bitter, sour, or sweet in various proportions, which may be imitated by suitable mixtures of NaCl, quinine, tartaric acid, and glucose, the proportions giving the taste equation constant for the individual for that particular salt—*e.g.*, for one subject, $0{\cdot}275n.K_2SO_4=[0{\cdot}017n.NaCl+0{\cdot}0000252n.Q+0{\cdot}00083n.T]$. The commonest equations are 3-component ones. Though one component may be below the threshold for separate recognition when in presence of the others, yet its presence is essential to completely identify the taste of the mixture with that of the salt it imitates. The sharpness of discrimination in taste is remarkable —*e.g.*, for quinine a change of $6\times10^{-6}n$ can be detected. Separation of taste from tactile and olfactory sensations is of great importance in these experiments.—C. L. E.

PSYCHOLOGY

4190. Congenital Word-Blindness. Lucy G. Fildes (*Brain*, 1921, **44,** 286-307).—Examination of 26 children æt. 9 to 16 reported of their teachers as finding great difficulty in reading, none of them less than 4 years backward in this respect. By the Stanford-Binet tests no relation was found between the general intelligence quotients and the disability to read. The non-readers showed a difficulty in discriminating between somewhat similar visual symbols and remembering the distinctive names rather than in discriminating and remembering distinctive names for well-differentiated symbols. No correlation was found between the auditory learning of sentences and the visual difficulties. As similarity between the visual (and auditory) symbols increases, the difficulties of right association of the symbols with their meanings increase for "non-reader" children more than for normal children. That deficiency in reading is always a sign of defective general intellect is unsupported by the results obtained. The children examined showed subnormal power in discriminating visual (and auditory) symbols which were closely similar and failure to remember such forms. Many of them used visual imagery where other matters than language symbols were concerned.—C. S. S.

4191. Cerebral Function in Learning. III. The Motor Areas. K. S. Lashley (*Brain*, 1921, **44,** 255-85).—Experiments on white rats to see whether a trained habit based predominantly on visual experience was retained after destruction of all that part of cerebral cortex which yields motor reactions to electric stimulation and after destruction of the caudate nucleus of the corpus striatum in combination with the above cortical lesion. The visuo-motor habit taught was the taking of the track leading to food in a Yerke's discrimination box, the animal being trained to choose the illuminated alley. Clear results were obtained showing that the trained habit is well retained after the above-mentioned combined destruction has been carried out in both hemispheres simultaneously. The habit is executed in spite of difficulties in motor taxis due to the cerebral lesions. These difficulties seem to lie primarily in the assumption of new attitudes.—C. S. S.

4192. Zur Psychologie des Schimpansen. W. Köhler (*Sitz. d. preuss. Akad. d. Wiss.*, 1921, **39,** 686-91).—The chimpanzee has an excellent memory; it is able to do under like conditions things which it learnt long previously. It shows a strong desire for companionship with its own kind. It never loses interest in a mirror, even after having tried in vain to locate the mirror images. It seems to recognise photographs. When at play it sometimes performs a primitive dance.—D. H. de S.

4193. Des oscillations de l'attention au cours d'excitations périodiques rythmées de la vue, de l'ouïe et du toucher. P. Dodel (*Compt. rend. soc. biol.*, 1921, **85,** 1061-4).—A subject is made to press a key each time a continually recurring signal is perceived. The time of the response after receipt of the signal is much more regular when the signal is by sound than when it is a visual signal.—J. H. B.

4194. Choice between Adequate and Inadequate Diet by Rats and Mice. Helen S. Mitchell and L. B. Mendel (*Amer. J. Physiol.*, 1921, **58,** 211-25).—Evidence is given that these animals select advantageous diets from alternatives apparently alike to the senses.—W. M. B.

4195. Über den Lagereflextonus von Raja clavata. Ein Beitrag zur Kenntnis der tierischen Hypnose. J. G. Schaefer (*Biol. Zentralbl.*, 1921, **41,** 289-96).—If a ray is held still on its back for a short time there follows a period of hypnosis, during which the animal makes no attempt to recover its normal position. The muscles pass into a state of tonic contraction consequent upon a continuous stimulation of the higher centres, together with an inhibition of voluntary impulses. This case of hypnosis differs from those observed in other fishes, as usually the hypnotic condition is one of muscular relaxation and not tonic contraction.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4196. The Cerebral and Neuro-Muscular Manifestations of Digitalis. D. I. Macht and W. Bloom (*Arch. Int. Med.*, 1921, **28,** 678-86).—The behaviour of rats in the circular maze previously described by these authors was depressed by small doses of digitalis. —J. H. B.

4197. Fatigue and Efficiency of Smokers in a Strenuous Mental Occupation. J. P. Baumberger and E. G. Martin (*J. Ind. Hygien.*, 1920, **2,** 207-14). **An Output Study of Users and Non-Users of Tobacco in a Strenuous Physical Occupation.** J. P. B., E. E. Perry, and E. G. M. (*ibid.*, 1921, **3,** 1-10). **Fatigue and Error in a Mental Occupation.** J. P. B. (*ibid.*, 1921, **3,** 149-53).—Statistical studies which show that smoking lowers efficiency (output) in mental but not in physical occupations; tobacco chewers always show a low output.—R. K. S. L.

CEREBRO-SPINAL FLUID

4198. Cerebro-Spinal Pressure. I. Effect of Salt Solutions given Intravenously. II. Its Relation to the Rigid Skull. III. Its Relation to Venous Pressure. L. H. Weed and W. Hughson (*Amer. J. Physiol.*, **53,** 85, 101-30).—I. Intravenous injection of Ringer's fluid causes a temporary rise in cerebro-spinal and brachial venous pressures (cat), and a fall of arterial pressure. Hypotonic solutions cause a prolonged fall in C.S. pressure, a slight and temporary fall in venous and a slight rise in arterial pressure. Hypertonic solutions produce prolonged and profound fall in C.S. pressure, a rise in venous pressure followed soon by a fall, and a fall in arterial pressure followed by a rise. II. When the skull is opened, hypertonic solutions fail to reduce the C.S. pressure to negative values. If the skull opening is sealed up, negative pressures are easily obtained in this way; unsealing causes an immediate rise to positive readings. The skull is regarded as an inelastic, rigid container of the central nervous system. III. The pressure of the C.S. fluid is dependent in part upon cerebral arterial, and in larger degree on cerebral venous pressure, but is independent of both. The full evidence for this and other conclusions must be read in the original. (This series of papers confirms one of the main outcomes of the work by Dixon and myself—viz., that C.S. pressure is independent of, though secondarily influenced by, blood-pressures, and largely relieves us of the task of answering Becht, who has advanced opposite views.)—W. D. H.

4199. Über die Wechselbeziehungen zwischen Blutplasma und Gewebeflüssigkeiten, insbesondere Kammerwasser und Cerebrospinal flüssigkeit—I. J. de Haan and S. van Creveld (*Biochem. Zeit.*, 1921, **123,** 190-214).—The glucose content of the aqueous humour and the cerebro-spinal fluid of the rabbit is less than that of the blood-plasma.

In hyperglycæmia produced by adrenaline the diffusion of glucose into the two fluids is moderately rapid, and of the same order in both. The excess of glucose in normal blood-plasma over that of the aqueous humour is attributed to the non-dialysable bound sugar, whilst the difference in the cerebro-spinal fluid is augmented by the greater consumption of glucose by the brain.—H. K.

4200. Beiträge zur Theorie der Kolloidreaktionen im Liquor cerebrospinalis. P. Ellinger (*Zeit. physiol. Chem.*, 1921, **116,** 245-65).—Zsigmondy's original observation that proteins protect colloidal gold solutions from precipitation by NaCl forms the basis of tests applied clinically to the cerebro-spinal fluid. Under certain conditions the fluid from cases of syphilis and meningitis reacts with gold solutions, while normal fluid produces no change. The author uses "collargol" instead of gold, and studies the best conditions for the reaction. The nature of the reaction is discussed, and experiments are made to test various theories which have been put forward.—H. W. D.

BLOOD

4201. Die Einwirkung einiger Elektrolyte und Anelektrolyte auf die Senkunsgeschwindigkeit der roten Blutkörperchen des Pferdes. J. Runnström (*Biochem. Zeit.*, 1921, **123,** 1-26).—The velocity of sedimentation of horse corpuscles was determined in presence of various salts, HCl, serum, gelatin, and narcotics. The results obtained vary enormously, and are interpreted on the hypothesis that the action of ions is due to adsorption on the surface of the corpuscle, the presence of colloids modifying the adsorption of the ions through competition for the erythrocyte surface.—H. K.

4202. Über die Analyse einer Volumkurve von Blutkörperchen in hypertonischen Lösungen, welche zugleich die Differenzierung von osmotischen und kolloidchemischen Volumänderungen ermöglicht. T. Takei (*Biochem. Zeit.*, 1921, **123,** 104-27).—Blood-corpuscles of men, rabbits, and oxen contract in hypertonic solution proportionally to the external osmotic pressure, when this pressure does not exceed 4 times the normal pressure, quite independent of the nature of the medium. Beyond this point there is a sudden increase of corpuscular volume which may almost reach the initial normal volume. This is ascribed to a swelling of the erythrocyte colloids. The shrinkage is a reversible process, but the swelling is irreversible, as hæmolysis takes place on dilution. In serum rendered hypertonic by glucose there is no swelling of the corpuscles. —H. K.

4203. The Permeability of the Red Corpuscles for Amino-Acids. S. Kozawa and N. Miyamoto (*Biochem. J.*, 1921, **15,** 167-70).—Erythrocytes of ox, man, and goat are, to a certain extent, permeable for amino-acids such as glycine and histidine.—J. A. H.

4204. Conditions causing an Unequal Distribution of Erythrocytes in the Blood-Stream. E. F. Bostrom (*Amer. J. Physiol.*, 1921, **58,** 195-209).—Rise of blood-pressure increases number of red cells in peripheral vessels, with decrease in the heart. If red corpuscles are suspended in $m/10$ sodium bicarbonate with CO_2 in 0·9% NaCl, the suspension is stable at 38°, but sinking takes place at a lower temperature. This is accounted for by the greater H-ion concentration at the lower temperature, which diminishes the negative charges and facilitates aggregation. A local injection of acid sodium phosphate causes an increase in the number of erythrocytes in that part. It is stated that there are good reasons for assuming an increase of C_H in the periphery after adrenaline, asphyxia, or abdominal pressure.—W. M. B.

4205. Die Beeinflussung der Oxydationsgeschwindigkeit von roten Blutkörperchen durch Kalium und Radioaktivität. P. Ellinger (*Zeit. physiol. Chem.*, 1921, **116,** 266-76). —The presence of K is essential for the respiration of blood-cells (goose). K can be replaced by Rb, but not by Cs. Radioactive substances cannot replace K, and, indeed,

injure the respiratory process. Fluorescein behaves similarly, but very small amounts of eosin increase the oxygen usage.—H. W. D.

4206. The Relationship of Blood-Groups to Disease. J. A. Buchanan and E. T. Higley (*Brit. J. Exp. Pathol.*, 1921, **2,** 247-55).—There is no relationship between blood-groups and malignancy or any other disease. Nationality should be taken into consideration in the presentation of statistical studies of blood-grouping.—*Author's Abstract (abbreviated).*

4207. Fragility of the Red Cells. R. M. Greenthal and W. S. O'Donnell (*Amer. J. Physiol.*, 1921, **58,** 271-7).—The fragility to hypotonic salt solutions is increased after treatment with CO_2, 5% NaCl, and in cardiac disease with cyanosis. It is decreased by 6% sodium bicarbonate or arsenic (Fowler's solution). It is unchanged by CO, adrenaline, atropine, diphtheria, and tetanus toxins, or by ether anæsthesia. —W. M. B.

4208. Bile Salts and Hæmolysis. E. Ponder (*Brit. J. Exp. Pathol.*, 1921, **2,** 289-91). —The bile salts do not cause hæmolysis when in the blood-stream, nor does hæmoglobinuria follow their injection. This is not due to their forming an adsorption product with the albumins of the serum. Since they are colloidal in nature, they are with difficulty excreted by the kidney.—*Author's Abstract.*

4209. Über den Einfluss der Temperatur auf die Hämolyse durch Hypotonie. A. Jarisch (*Pflüger's Arch.*, 1921, **192,** 255-71).—The resistance of the red cells to hæmolysis increases with rise of temperature between 0° and 45° to 50° C., but then very rapidly falls off as temperatures are reached which are themselves capable of causing hæmolysis. Different animals vary in the sensitiveness to temperature influence on hypotonic hæmolysis; the differences are explained as dependent upon different phosphate content of the corpuscles, low PO_4''' content corresponding with a small temperature effect. By adding phosphate buffer mixtures to ox blood, which contains but little PO_4''', the temperature effect could be intensified. Na_2SO_4 and Na tartrate had no such effects. The phosphates probably act by keeping the C_H constant, so that as temperature rises the OH′ concentration rises. If the OH′ is kept constant by adding NH_4 salts, the effect of temperature is diminished.—C. L. E.

4210. The Influence of Light on the Blood. E. Aschenheim and S. Meyer (*Zeit. exp. Path. Therap.*, 1921, **22,** 22-33).—No marked differences could be found between natural and artificial light. The reaction of the blood to illumination is the production of an increased number of non-granulated mononuclear leucocytes, apparently at the expense of the polymorphic neutrophils. The eosinophils and mast cells are not disturbed. The hæmoglobin and erythrocyte content is increased. Young children react in a shorter time, and give a greater increase in the immature cells than do older children.—W. D. H. (*Chem. Abstr.*).

4211. Alterations in the Leucocytes after Exposure to Artificial Sunlight of High Altitudes. M. Baumann (*Zeit. exp. Path. ü. Therap.*, November, 1920).—The artificial light was a mercury vapour quartz lamp, and the effects are: (*a*) In man, initial increase of polynuclears and decrease of lymphocytes, then an increase of the latter. The eosinophils and large mononuclears also increase. (*b*) In the guinea-pig, after exposure for ½ to 1½ hours there is apathy and weakness for 5 to 6 hours. Death may result. In all cases severe lesions of the spleen and bone-marrow result.—J. A. H. (*Med. Sci.*).

4212. Determination of the Coagulation Time of the Blood in Animals. O. Inchley (*J. Pharm. Expt. Ther.*, 1921, **18,** 237-40).—So many methods have been described for determining the time of blood-coagulation that presumably no convenient and reliable method has yet been devised. Here is another, a modification of Buckmaster's, which has given good results in the author's hands.—J. A. G.

4213. Über die Einwirkung einiger Gerinnungsfaktoren auf die Gerinnung des Blutes. L. Heller (*Biochem. Zeit.*, 1921, **123,** 90-103).—At a lower concentration than about 10%, normal blood does not clot. At a blood-dilution of 1 : 200, the minimum concentration of $CaCl_2$ necessary for clotting is 0·005 to 0·006%; at higher dilutions, the

minimal $CaCl_2$ concentration is higher, and at lower blood-dilutions, lower. The concentration of NaCl is also of influence. The results are applied to the blood of pathological cases.—H. K.

4214. Utilisation de la grenouille pour la démonstration de l'action anticoagulante des acides nucléiques. Doyon (*Compt. rend.*, 1921, **173,** 1120-2).—The solution used contains 0·003 gm. of nucleic acid in 0·5 c.c., together with small amounts of sodium carbonate and chloride; about 60 drops of frog's blood are allowed to fall into the liquid; they do not clot. The red cells are deposited, and keep their shape for days; the plasma is clear. The blood so treated resists the action of serum, but the addition of $CaCl_2$ favours coagulation. When the solution is injected into the dorsal lymph sac, the blood removed 30 minutes later fails to clot, but 4 hours later several filaments of fibrin are to be seen. An intravenous injection determines the incoagulability of the blood in less than 3 minutes. Control experiments show that the anticoagulating action is due to the nucleic acid, and not to the sodium salts.—Ha. W.

4215. Über das Flockungsvermögen des menschlichen Blutplasmas. W. Starlinger (*Biochem. Zeit.*, 1921, **123,** 215-24).—Flocculation in blood-plasma, produced, for instance, by saturated NaCl solution, can be used as a measure of fibrinogen content. Inhibition of flocculation is produced by acid, alkali, neutral salts, increase of temperature, pepsin, and Witte peptone, whilst agar, gum-arabic, gelatin, and glycine increase flocculation.—H. K.

4216. Relation entre la viscosité sanguine et la répartition de l'acide urique dans le sérum et dans le sang total. Rouzaud and Thiéry (*Compt. rend. soc. biol.*, 1921, **85,** 962-4).—The viscosity of the blood, which depends on the number of red cells, determines the distribution of uric acid between plasma and corpuscles. In patients with excessively viscous blood, the serum contains proportionally less uric acid than in patients with less viscous blood; in the latter, whether anæmic or hydræmic, the amount of uric acid in the serum may occasionally exceed that in the whole blood (!).—J. H. B.

4217. The Ammonia Content of the Blood and its Bearing on the Mechanism of Acid Neutralisation in the Animal Organism. T. P. Nash, Junior, and S. R. Benedict (*J. Biol. Chem.*, 1921, **48,** 463-88).—After a discussion of previous work on the subject, the authors describe an aeration method of determining NH_3 in blood that gives satisfactory results. Using this method, they determine the NH_3 in blood under different conditions, and come to the conclusion that there is a small amount of preformed NH_3 in blood (about 1 mg. per 100 c.c. of blood in the dog), that this is equally distributed between the plasma and the corpuscles, and that the injection of acid intravenously is without effect on NH_3 content of blood. They also find that blood from the renal vein always contains more NH_3 than blood from the systemic circulation. Also that blood from phloridzinised dogs whose urine was richer in NH_3 than normal dogs contained no more than the normal amount of NH_3. They investigated the blood from dogs after double nephrectomy, also after tying both ureters, and found no evidence of any increase of NH_3. The authors finally come to the conclusion that the kidney is the seat of ammonia formation. They discuss the possible mechanism of this and its relation to acidosis.—T. A. W.

4218. Inorganic Blood-Phosphate. E. P. Lehman (*J. Biol. Chem.*, 1921, **48,** 293-304).—The inorganic phosphate of rabbit's blood is practically constant in amount—4·87 mg. of P per 100 c.c. If it is increased fivefold by intravenous injection, it returns to normal within 4 hours; if the dose is 75 mg. of P per kilo. of body weight, a proportion of the animals suffer from tetany. The ingestion of cod-liver oil does not alter the level of the blood-phosphate in rabbits and dogs. The injection of a large dose of NaH_2PO_4 had no effect on the calcification of callus.—T. A. W.

4219. Über die Chlorverteilung im Blute. S. van Creveld (*Biochem. Zeit.*, 1921, **123,** 304-14).—The results of recent workers on the distribution of chloride in the blood are criticised. Direct estimation on the circulating blood shows that the corpuscles are permeable, the percentage of chloride in the corpuscles relative to that in

the plasma being greater in venous than in arterial blood. There is no evidence of fixation of chloride as a fibrinogen chloride compound.—H. K.

4220. Relation entre la viscosité et la répartition de la cholestérine dans le sérum et dans le sang total. Rouzaud and Thiéry (*Compt. rend. soc. biol.*, 1921, **85,** 964-5).—The ratio of cholesterol in the serum to that in the whole blood varies directly with the viscosity. With many red cells there is a larger fraction of cholesterol in the serum than with few. This is considered to be of importance in cases of hypercholesterinæmia.—J. H. B.

4221. Über den Nachweis von Glucuronsäure im menschlichen Blut mit der Orcin- und Naphthoresorcinprobe. E. Diebschlag (*Virchow's Arch.*, 1921, **230,** 179-90).—Description of the method and discussion of the results.—H. W.

4222. Über die extramedulläre Blutbildung bei anämischen Mäusen. H. Jaffé (*Beitr. z. path. Anat. u. z. allg. Path.*, 1921, **68,** 224-57).—An extramedullary hæmatopoiesis can be produced in mice by means of chronic intoxications with hæmolytic substances, repeated blood-letting, and by grafting of transplantable tumours. The first organ to react is the spleen, probably owing to the fact that it normally contains a considerable amount of myeloid tissue. In anæmic mice this is developed in the pulp, and its production is independent of the Malpighian corpuscles. These behave differently in different forms of anæmia. In those consequent on blood-letting they are larger than normal and more active. When hæmolytic poisons or tumour grafts are used they diminish. Their atrophy leads to leucopenia. The lymph glands show similar changes. If before injecting phenylhydrazine or pyrogallol the spleen is removed, the lymph glands greatly increase in size, and are almost entirely filled with myeloid tissue. The same occurs after blood-letting in spleenless animals. Formation of myeloid tissue occurs in the liver after the poisons, occasionally after blood-letting, and especially when the spleen has been removed.—C. d. F.

4223. Sur la composition du liquide apparaissant dans le poumon au cours de l'œdème pulmonaire aigu expérimental. A. Mayer and P. Morel (*Bull. soc. chim. biol.*, 1921, **3,** 520-32).—The fluid of pulmonary œdema produced in a dog was analysed, and the results presented in 9 tables of figures. Its composition was compared with that of the blood-plasma.—W. D. H.

HEART

4224. Heart Problems. E. H. Starling (*Lancet*, 1921, ii., 1199-1202).—A lecture on applied physiology to clinical observers. The main headings are the margin of adaptation, the blood-supply of the brain, diminished cardiac output an essential factor in heart failure, the heart-lung preparation, the mechanism of adaptation, effect of fatigue, failure of compensation and its treatment.—W. D. H.

4225. The Venous Supply of the Heart. R. Burton-Opitz (*Amer. J. Physiol.*, 1921, **58,** 226-70).—A lengthy discussion of certain experimental work, of which, unfortunately, no summary is given. The main results appear to be as follows: Compression of the superior branch of one pulmonary artery caused diminished flow in the inf. vena cava and fall of arterial pressure. Ventilation greater than the normal led to reduction in venous supply to the heart. Partial compression of the main pulmonary artery had the same effect. Tricuspid regurgitation led to raised venous pressure, decrease in flow in the inf. vena cava, and fall in carotid pressure. The immediate effects of aortic stenosis were similar, but not serious until the lumen was reduced to one-half. Compression of the vessels of the head and forelegs caused rise in aortic and inf. cava pressures, with increase in venous flow. Compression of the thoracic aorta caused fall in cava pressure and rate of flow, with rise in carotid pressure, while the flow in the superior cava was increased. Stimulation of the splanchnic nerves has very little effect on the flow through the inf. cava. Tables of normal volumes and velocities in the inf. and sup. cavæ are given.—W. M. B.

4226. Das Alternansproblem. S. de Boer (*Pflüger's Arch.*, 1921, **192,** 183-224).—Presentation of results already published (Abstract No. 3399, Vol. VI., p. 499), together with some further details, unsuitable for abstraction, in favour of the view that metabolic tissue derangement is the cause of alternating heart contractions.—C. L. E.

4227. Terminal Cardiac Arrhythmias. F. R. Dieuaide and E. C. Davidson (*Arch. Int. Med.*, 1921, **28,** 663-77).—Electrocardiograms are shown taken from three patients on the point of death. P-R interval, Q-R-S interval, and Q-T interval are all prolonged. The R and T waves are diminished in amplitude. The normal pacemaker lost control of the rhythm, with the production of nodal rhythm and heart block. Auricular and ventricular systols were also observed.—J. H. B.

4228. Idio-Ventricular Periodicity. D. H. de Souza and J. A. Hewitt (*Proc. Roy. Soc.*, 1921, **92B,** 385-8).—A perfusion experiment on the excised heart of the frog is described and discussed, in which periodic grouping occurred as an independent ventricular phenomenon. The heart was being perfused with inositol dissolved in Ringer's solution. The authors are uncertain whether the effect was due to the inositol, but in spite of long experimentation it was never seen again.—W. D. H.

4229. The Quinidine Treatment of Auricular Fibrillation. A. W. Hewlett and J. P. Sweeney. **Effects of the Administration of Quinidine Sulphate in Auricular Fibrillation.** W. W. Hamburger. **Clinical Experience with Quinidine in Auricular Fibrillation.** B. S. Oppenheimer and H. Mann (*J. Amer. Med. Assoc.*, 1921, **77,** 1793, 1797, 1800-3).—Quinidine checks auricular fibrillation in some cases, roughly about 50%.—C. L. E.

4230. Ionenbalanceering. T. P. Feenstra (*Dissert.*, Utrecht, 1921; *Onderzoek. physiol. Lab. Univ.*, Utrecht, 1921, Zesde Reeks, ii., 1-91).—A treatise on the balancing of ions in physiological salt solutions, a subject much to the fore in the Utrecht laboratory.—W. D. H.

4231. On Sensibilisation to Radio-Activity by the Action of Hormones. H. Zwaardemaker (*Proc. kon. Acad. v. Wet., Amsterdam*, Sept. 25, 1920, **23**; *Onderzoek. physiol. Lab. Univ.*, Utrecht, 1921, Zesde Reeks, ii., 233-6).—It has been shown by Tappeiner and others that sensibilisation of organs and organisms to the harmful influence of light and other radiations can be accomplished by fluorescent substances such as eosin. The present experiments deal with the cold-blooded heart; α-rays from uranium and β-rays from potassium both keep the heart going, but the 2 may be balanced so that the heart stops; an excess on one side or the other starts it again. The amounts necessary for equilibrium vary with winter and summer. But when there is equilibrium (heart stoppage), a number of substances shift it so that the heart beats again. Among these are choline, which shifts it to the K side, and adrenaline to the Ur side. The changed particles send the radiation with great velocity through the lipoid films on the cell surface, and thus evoke a catalytic effect or stimulus.—W. D. H.

4232. The Effect of Digitalis on the Automaticity of the Primary Cardiac Pacemaker. B. H. Schlomovitz (*Trans. Sect. Pharm. Ther. Amer. Med. Assoc.*, 1921, **6,** reprint, pp. 15).—The S-A node is markedly responsive to digitalis early in the therapeutic stage, but later may show loss of responsiveness. Still later the heart shows toxic signs. Experiments on etherised dogs and cats.—C. L. E.

4233. Pneumogastrique, atropine et choc chloroformique. L. Garrelon, A. Leleu, and R. Thuillant (*Compt. rend. soc. biol.*, 1921, **85,** 1013-5).—If 2 mg. atropine are injected intravenously into a rabbit, stimulation of the intact vagus is still followed by cardiac inhibition during a period in which stimulation of the peripheral end of the cut vagus caused no inhibitory effect whatever. This phenomenon could not be elicited in the dog. It is suggested that stimulation of the intact vagus provoked centripetal impulses, which in turn led to an augmented efferent discharge, causing the cardiac arrest.—J. H. B.

4234. Deacetylated Hellebore and the Frog's Heart. E. Frey (*Z. exp. Path. Ther.*, 1921, **22,** 54-64).—This causes acceleration and extra-systoles. —W. D. H. (*Chem. Abstr.*).

4235. Over colloidaal ionium hydroxide en hartautomatie. W. H. Levend (*Dissert.*, Utrecht, 1921; *Onderzock. physiol. Lab. Univ.*, Utrecht, 1921, Zesde Reeks, ii., 162-203). —Ionium belongs to the group of radio-active substances emitting α-rays. Experiments on the frog's heart, in which it was employed as a constituent of the perfusion fluid, and its antagonism to other substances are described.—W. D. H.

CIRCULATION

4236. Problème d'oscillométrie medicale: détermination de Mx par une courbe dynamométrique. R. Alexandre and R. Moulinier (*Compt. rend. soc. biol.*, 1921, **85,** 929-31).—A simple and interesting mathematical analysis of the curve obtained of the changes in the volume of a sphygmomanometer cuff when the pressure is gradually raised until the artery is obliterated. A method of correcting any curve is given, so that the diastolic pressure is accurately determined.—J. H. B.

4237. La notion d'un simple "point anguleux" est-elle suffisante comme critère oscillométrique de la pression minima? V. Pachon and R. Fabre (*Compt. rend. soc. biol.*, 1921, **85,** 1073-6).—An interpretation of the curve obtained by raising the pressure in the armlet of a sphygmomanometer, and recording the pressure changes on a drum until the systolic arterial pressure is reached. The point indicating diastolic pressure is defined.—J. H. B.

4238. Perception de bruits artériels (souffles anévrysmaux et bruits simples) en aval d'une manchette gonflée écrasant les vaisseaux d'un membre. C. Lian and H. Welti (*Compt. rend. soc. biol.*, 1921, **85,** 907-8).—If the brachial artery is occluded completely by an inflated sleeve, it is still possible to hear the noise of a subclavian aneurism in the region of the radial artery, etc. This proves the conduction of sound by the tissues, —J. H. B.

4239. Polare Erregung und Hemmung an Arterien. P. v. Liebermann (*Pflüger's Arch.*, 1921, **192,** 130-4).—The arteries (but not the veins) of the frog's web respond to a galvanic stimulus much as the ureter does. The anode dilates over a wide area, the cathode constricts, but quite locally.—C. L. E.

4240. Venipuncture of the Superior Longitudinal Sinus in the New-Born. J. W. Gordon (*J. Amer. Med. Assoc.*, 1921, **77,** 1721-2).—The method is claimed to be the best for obtaining blood or for intravenous medication. The posterior angle of the anterior fontanelle was the site selected, and the sinus lies $\frac{1}{4}$ inch from the skin surface. —C. L. E.

4241. Über die Geschwindigkeit der Pulswelle beim Menschen. W. Weitz and C. Hartmann (*Deutsch. Arch. f. klin. Med.*, 1921, **137,** 91-100).—Determination of the velocity of the pulse-wave in a series of cases, with some theoretical considerations. —H. W.

4242. The Circulation Time and Quantity of Blood in the Lungs. G. N. Stewart (*Amer. J. Physiol.*, 1921, **58,** 20-44).—On the basis of measurements of the minute volume of the heart and the mean circulation time through the lungs, the calculated values for the volume of blood contained in the lungs come out higher than those obtained by ligature of the lung vessels. Direct measurements with the aorta completely blocked gave 22% of the total blood in one animal. Blocking both sides of the heart simultaneously gave 21% and 18·6% in two cases.—W. M. B.

4243. Circulation Time. V. Of the Spleen, Kidney, Intestine, Heart, and Retina. G. N. Stewart (*Amer. J. Physiol.*, 1921, **58,** 278-95).—The circulation time of the spleen is 4 to 5 seconds, increased by cold and exposure. That of the kidney is relatively long, 6 to 8 seconds. Local application of warmth may diminish the time after previous cooling. That of the intestines is short, 2·5 seconds to less than 4 seconds. That of the testis is rather less than 4 seconds. The coronary circulation is the shortest, 2 to 3 seconds, with the exception of that of the retina, which is less than 2 seconds.—W. M. B.

4244. Sur les effets vasomoteurs de l'excitation du splanchnique chez le lapin. E. Gley and A. Quinquaud (*Compt. rend. soc. biol.*, 1921, **85,** 1045-6).—If the peripheral end of the great splanchnic nerve is stimulated electrically in a rabbit, the tracing of the rise of blood-pressure on a kymograph only shows a " step " in a certain number of cases (12 out of 42).—J. H. B.

4245. Absorption from the Peritoneal Cavity. C. Bolton (*J. Pathol. and Bacteriol.*, 1921, **24,** 429-45).—The course of the lymphatics which drain the cavity is carefully traced. Particles of approximately the size of red corpuscles pass easily between the endothelial cells with the lymph. Drainage is accomplished solely by the force of the respiratory muscles. Colloid dyes diffuse slowly into the blood, crystalloid more rapidly, but probably proteins have too large molecules to pass in this way. Poisons formed by bacteria, etc. (even if indiffusible through artificial membranes), may still be directly absorbed into the blood through the peritoneum, provided they are not of too great molecular complexity.—W. D. H.

RESPIRATION

4246. Thoracic Respiration. Sir W. A. Lane (*Lancet*, 1921, ii., 1317-9).—The author holds views regarding the action of the intercostal muscles which he has evidently preached before. He blames the physiologists for their deafness to his pronouncements. He ought to try the anatomists first, for of such is the kingdom of surgery.—W. D. H.

4247. Respiration VII. The Vital Capacity. F. W. Peabody and C. C. Sturgis (*Arch. Int. Med.*, 1921, **28,** 501-10).—General weakness has no effect on the vital capacity.—J. H. B.

4248. Oxy- and CO-Hæmoglobin : The Effects of Acid and Carbon Dioxide. A. V. Hill (*Biochem. J.*, 1921, **15,** 577-86).—Theoretical. Suggested explanations are given of the S-shaped dissociation curve of oxy-hæmoglobin in the presence of salts, and the similar curve of CO-hæmoglobin; the identical effects of CO_2 on these curves; the rectangular hyperbola relating CO-saturation to CO-pressure, or O_2-saturation to O_2-pressure, in blood or hæmoglobin fully saturated with a mixture of O_2 and CO; the absence of any effect of CO_2 on these curves; the relationship between CO-saturation and O_2-pressure, or between O_2-saturation and CO-pressure in blood or hæmoglobin partly saturated with a mixture of O_2 and CO; differences existing in the dissociation curves of different individuals or species.—J. A. H.

4249. Visceral Sensory System. IX. The Readjustment of the Peripheral Lung Motor Mechanism after Bilateral Vagotomy in the Frog. T. L. Patterson (*Amer. J. Physiol.*, 1921, **58,** 169-81).—Bilateral section of the vago-sympathetics in the frog cuts off the inhibitory control, so that the lungs pass into a tonic contracted state and their function is prevented. The effect is unilateral when one vagus only is cut. The tonus begins to disappear in about 12 days, but this is not completed until 8 months. Air is forced into the stomach by respiratory movements in the early stages after vagotomy. The buccal movements are but little affected, whereas the opening of the glottis and the entry of air into the lungs are abolished; but these gradually return with the disappearance of lung tonus. There was no regeneration of the vagus fibres.—W. M. B.

4250. Experimental Degeneration of the Vagus Nerve and its Relation to the Nerve Terminations in the Lung of the Rabbit. O. Larsell and M. L. Mason (*J. Comp. Neurol.*, 1921, **33,** No. 5).—The degeneration, followed by intravitam staining of the lungs with methylene blue, leads to the following conclusions: The vagus nerves supply the preganglionic fibres to the ganglion cells which are scattered along the bronchi, as is shown by the disappearance of most of the pericellular networks about these cells. Most of these fibres come from the vagus of the homolateral side, but some pericellular networks remain, and are probably derived from the contralateral side. The number of fibres in the bronchial musculature which take the stain is very little affected by the

degeneration of the fibres of the vagus nerve. A few sensory terminations remain in the lung of the operated side after degeneration of the vagus leading to it. These endings are believed to be derived from the vagus of the opposite side. The number of nerve fibres in the walls of the pulmonary bloodvessels which take the stain is unaffected by degeneration of the vagus nerve.—W. D. H. (*W. I.*).

4251. L'absorption sous-cutanée de l'oxygène dans les ascensions en montagne et en avion. R. Bayeux (*Compt. rend.*, 1921, **173,** 937-9).—There is a certain resistance to the subcutaneous injection of oxygen which is not affected by variations in arterial pressure, nor by adiposity, but which varies according to muscular activity. Experiments were made to determine whether the anoxæmia of high altitudes causes a lowering of this resistance. It was found that the resistance diminished from 40 cm. in the plain to 16 cm. of water at the summit of the Grand Casse. To eliminate fatigue the experimenter entered a chamber where the pressure was lowered in 42 minutes from 740 to 390 mm. Hg, this corresponding to a height of 5,300 m. The resistance to oxygen decreased from 37 to 21 cm. of water. The author concludes that a subcutaneous injection of oxygen permits rapid ascent to a great height without danger, and with only a slight quickening of the pulse and of respiration. He considers that subcutaneous injections of oxygen should be used as a preparation for an ascent.—Ha. W.

4252. Physiological Effects of Altitude. E. C. Schneider (*Physiol. Rev.*, 1921, **1,** 631-57).—J. A. H.

4253. The Excretion of Acetone from the Lungs. A. P. Briggs and P. H. Schaffer (*J. Biol. Chem.*, 1921, **48,** 413-28).—The distribution coefficient of acetone for water and air at 37° and 750 mm. was found to be 334 for $\frac{\text{water}}{\text{air}}$; for blood-serum it is about 337. Similar distributions were found for blood and alveolar air. Acetone is excreted from the lungs and kidney by a process of physical diffusion.—T. A. W.

4254. Development of the Gills in the Amphibian Embryo. R. G. Harrison (*Biol. Bull.*, 1921, **41,** No. 3).—Experiments were made upon embryos of *Amblystoma punctatum* at stages between closure of medullary folds and appearance of tail bud. Replacement of gill ectoderm by ectoderm from flank results in suppression of gills and operculum, but when the grafted ectoderm is taken from near by (*e.g.*, pronephric or cardiac regions) gills may develop, their completeness depending upon distance of source of graft from gill region. After removal of gill ectoderm, without replacement, ectoderm from surrounding regions covers the wound, and normal gills may result, though development is often defective. Change of orientation of branchial ectoderm does not affect the normal development of gills. After removing gill mesoderm and covering wound again with branchial ectoderm, normal gills, usually of reduced size, develop. When the orientation of gill mesoderm and ectoderm is changed, marked irregularities result. Doubling the amount of mesoderm by superposition has no effect on normal development when orientation of graft is normal. Removal of gill ectoderm and mesoderm without replacement results in very high mortality, and only very imperfect regeneration of gills occurs in surviving individuals. Branchial ectoderm transplanted elsewhere, either alone or with mesoderm, forms no gills, though slight nodules may arise. Gills form in the absence of circulating blood, but they never expand fully, and have an atrophic appearance.—W. D. H. (*W. I.*).

ALIMENTARY CANAL

4255. Eine leicht auszuführende quantitative Rhodanbestimmung im Speichel mit Berücksichtigung physiologischer und pathologischer Zustände. A. Reissner (*Ergeb. d. ges. Zahnheilk.*, 1921, **6,** 297-328).—The application of the reaction with ferric chloride to the colorimetric determination of the amount of thiocyanate in saliva. This is

found to vary in normal persons from 0·004 to 0·035%, and to show marked changes during pathological conditions.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4256. Relation of the Gastric Content to the Secretory and Motor Functions of the Stomach. H. Wheelon (*Arch. Int. Med.*, 1921, **28**, 613-31).—The acid concentration in the stomach at the end of one hour's digestion is not constant in all parts of the stomach. Hence deductions from curves obtained in fractional test meals are vitiated by this fact.—J. H. B.

4257. The Relation of Calcium-Ion Concentration to the Stomach Movements induced by Irritation of the Vagus Nerve. R. Brinkman and (Miss) E. van Dam (*Verslag Akad. Wet. Amsterdam*, 1920, **29**, 899-907).—The sensitivity of a vagus nerve, numbed by a 0·6% NaCl (P_H=8·6), is rapidly restored by a solution of NaCl (0·5), $NaHCO_3$ (0·28), $CaCl_2.6H_2O$ (0.04), and KCl (0·02%) (P_H=8·6). Addition of 0·015 $CaCl_2.6H_2O$ to 0·6 NaCl+0·02% KCl prevents any decrease in sensitivity of the vagus nerve, provided the P_H is kept constant at 8·6. Rubber tubing should not be used, since it is likely to increase the acidity. $CaCl_2.6H_2O$ at concentrations of 0·02% or higher will not protect the sensitivity. Addition of 0·28% $NaHCO_3$ to the solution as a buffer permits the P_H to go as low as 7·7; at 7·3 the sensitivity decreases noticeably, and at 7·1 it disappears. It is uncertain whether the effect is due to a direct influence of HCO_3^- or only to its influence on the Ca^{++} concentration. Evidence favours the latter view.—W. D. H. (*Chem. Abstr.*).

4258. Sur l'excitabilité du nerf splanchnique et sur les mouvements de l'intestin, après l'ablation des surrénales. E. Wertheimer and E. Duvillier (*Compt. rend. soc. biol.*, 1921, **85**, 997-8).—After decapsulation in the dog, stimulation of the splanchnic nerve five hours later (under chloralose) causes inhibition of the intestinal musculature. In dogs and cats, intestinal movements, when a piece of intestine is suspended in Tyrode's solution, are just as brisk if taken from the animal after decapsulation as from a normal animal.—J. H. B.

4259. Lævulose Test for Hepatic Insufficiency. J. C. Spence and P. C. Brett (*Lancet*, 1921, ii., 1362-6).—In healthy adults, no rise in blood-sugar follows a dose of 50 gm. of lævulose. If the liver is inefficient, the blood-sugar rises in proportion to the dose given. The kidney threshold for this sugar is lower than that for glucose, but varies so much that urinary examination is an inaccurate method.—W. D. H.

4260. The Phenoltetrachlorphthalein Test for Liver Function. A. H. Aaron, E. C. Beck, and H. C. Schneider (*J. Amer. Med. Assoc.*, 1921, **77**, 1631-4).—The dye is injected intravenously, and the time required for its appearance in the duodenal contents is noted. In normal people the time is 14 to 20 minutes, average 17·2 minutes. The average for pathological cases is 32 minutes, and any time over 20 minutes suggests liver disease.—C. L. E.

4261. Physiologie der Leber. IV. Das Verhalten der Leber bei Eiweissfütterung nach voraufgegangener Glykogenmast. P. Junkersdorf (*Pflüger's Arch.*, 1921, **192**, 305-17).—Conversion of protein into glycogen in the liver can be replaced by conversion of liver glycogen into liver fat when unphysiological proteins are given.—C. L. E.

FOODS

4262. Dietetics and Public Health. E. C. van Leersum (*Lancet*, 1921, ii., 1252-4).—A summary of the author's Chadwick Lecture. The main measure urged is the instruction of the public by suitable propaganda, and by the training of "dieticians," who in America specialise in food questions, and render much help, not only to the people at large, but to the doctors in sanatoria and similar institutions.—W. D. H.

4263. Lupins in Human Nutrition. A. Funaro and L. Musante (*Atti r. accad. econ. agr. Georg. Firenze*, 1918 [5], **15**, 68-78; *Exp. Stat. Record*, **43**, 458).—Analyses of flour prepared from the common lupin before and after the extraction of the alkaloids are

reported. These indicate a slight increase in fat, protein, cellulose, and pentosans, and a decrease in other carbohydrates and in mineral matter. The high percentage of soluble proteins in lupin flour is thought to make it a valuable part-substitute for wheat flour, 15 parts of the lupin flour to 85 of the wheat flour being suggested as satisfactory proportions.—W. D. H. (*Chem. Abstr.*).

4264. Food Value of Asparagus. P. Juquelier (*Industrie française conserve*, 1919, **5,** 137-40; *Bull. Agr. Intell.*, **10,** 810).—Analysis gave H_2O 93·32, nitrogenous matter 1·98, fat 0·28, carbohydrates 2·74, mineral 0·54, and cellulose 1·14%. 100 g. of asparagus are equivalent to potatoes 16·46, peas 35·95, artichoke 74·27, and lettuce 85·46 g.; while 100 g. of asparagus yield 13·51 calories compared with 69·35, 37·66, 18·16, 15·80 for the above vegetables in the order named. These figures show that asparagus cannot be considered a nourishing dish. No substance is found in sufficient proportion to warrant its being regarded as of special value. Ash is largely acetate and phosphates of K, but their quantity and assimilability do not make them worthy of note.—W. D. H. (*Chem. Abstr.*).

4265. Subtropical Esculents. M. C. Grabham (*Lancet*, 1921, ii., 1357-62).—Details of various plants and fishes utilised or utilisable as foods. In the sea there is an unexplored food reserve. Deficiency diseases are stated to be absent in Madeira and other east Atlantic islands.—W. D. H.

4266. Effect of Ration on the Development of Pigs. C. O. Swanson (*J. Agric. Res.*, 1921, **21,** 279-341).—A fully detailed account of the effect of various foods on the weight and composition of the different organs of the pig.—W. D. H. (*Chem. Abstr.*).

VITAMINS

4267. The Vitamins. H. C. Sherman (*Physiol. Rev.*, 1921, **1,** 598-630).—J. A. H.

4268. Zur Kenntnis von organischen Nahrungsstoffen mit spezifischer Wirkung—IX. E. Abderhalden. **X.** E. Abderhalden and E. Wertheimer (*Pflüger's Arch.*, 1921, **192,** 163-174-82).—Further experiments to show that vitamins play a part in maintaining basal metabolism at the normal level.—C. L. E.

4269. Estimation of the Fat Soluble Factor. S. S. Zilva and M. Miura (*Biochem. J.*, 1921, **15,** 654-9).—The standard of comparison is the least dose which induces definite growth for 4 weeks after the animals (rats) have ceased to grow owing to deficient basal diet. The high potency of cod-liver oil is shown once more.—J. A. H.

4270. Fat Soluble Vitamin. IX. Ophthalmia. H. Steenbock, E. M. Nelson, and E. B. Hart (*Amer. J. Physiol.*, 1921, **58,** 14-9).—On a diet deficient in vitamin A, ophthalmia was produced in 3 out of 5 dogs within a period of 94 days. One was cured by cod-liver oil, and a second by the administration of an ether extract of 30 grms. of saponified cod-liver oil.—E. M.

4271. Lymphoid Tissue and Nutrition. W. Cramer, A. H. Drew, and J. C. Mottram (*Lancet*, 1921, ii., 1202-8; see Abstract No. 1836, Vol. VI., p. 265).—A continuation, and to some extent a recapitulation, of previous work. The opinion that the words vitamin and deficiency disease are misnomers will doubtless find many adherents, but the curious conclusion which figured in the author's first paper is more difficult to accept—viz., that vitamins are not necessary for every body cell. At any rate, the chief function attributed to the B vitamin is as a stimulus (or at least a necessity) to lymphoid tissue. The "deficiency disease," due to its absence, has its definite lesion—namely, atrophy of lymphoid tissue, and leucopenia as a consequence. This marasmus, so frequent in children, can be corrected by giving the B (water soluble) vitamin. No such marasmus results from deficiency in the A (fat soluble) vitamin. Lymph cells are concerned in absorption and assimilation of food from the intestine. Hence nutrition fails both in animals and man when their number falls.—W. D. H.

4272. Effect of B Vitamin on Appetite. S. Wright (*Lancet*, 1921, ii., 1921).—Experiments on rats. A and B vitamins were added to a basal diet in the form of cod-liver oil and marmite respectively. They grew and thrived. When the vitamin supply was withheld they took less food, the physical expression of loss of appetite, and went downhill. Restoration of B vitamin restored food intake and growth. The effect is due to a restoration of intestinal peristalsis. Nothing is said about lymphoid tissue. —W. D. H.

4273. Avian Polyneuritis and Beri-Beri. F. M. R. Walshe (*Med. Sci.*, 1922, **5,** 314-9).—A useful and thoughtful review of recent work, which demands attention from those interested in vitamin research. The lesson the writer seeks to convey here is that laboratory workers (and it may be added clinical observers) are too apt to draw conclusions from their particular method of approach to such problems. The nervous lesion in particular indicates that a positive agent is present as well as the negative factor. This is not the first time the author has urged this contention (see Abstract No. 864, Vol. V., p. 135).—W. D. H.

4274. The Sensitiveness to Poisons in Avitaminous Animals. W. S. v. Leeuwen and F. Verzár (*J. Pharm. Expt. Ther.*, 1921, **18,** 293-311).—The reaction of fowls (fed on polished rice) and cats (fed on autoclaved meat) suffering from avitaminosis to adrenaline, histamine, and choline (action on blood-pressure), to atropine (inhibition of vagus stimulation), and the reaction of isolated gut and œsophagus of these animals to pilocarpine, atropine, histamine, and choline did not differ materially from the normal. The known decreased activity of smooth musculature in avitaminosis is therefore caused, not by an irresponsiveness of the muscle itself, but " by a lack in the body of these animals of the normal stimulating chemical agents."—J. A. G.

4275. Vitamin B and the Secretory Function of Glands. G. R. Cowgill and L. B. Mendel (*Amer. J. Physiol.*, 1921, **58,** 131-51).—Solutions containing extracts of rice polishings, wheat embryo, navy bean, and yeast were first shown to contain vitamin B by experiments on polyneuritic dogs and pigeons. The action of the solutions on the secretory function of the pancreas, liver, and salivary glands was then tested, and they were found to be without effect on the rate of flow of these secretions. Again, it was found that the intestinal mucosæ from 8 polyneuritic dogs contained secretin. No evidence was obtained to support the hypothesis that a function of vitamin B is to stimulate these glands to secretory activity.—E. M.

4276. Secretin. V. Its Effect in Anæmia. A. W. Downs and N. B. Eddy (*Amer. J. Physiol.*, 1921, **58,** 296-300).—Subcutaneous administration of extracts of the duodenal mucous membrane (the name " secretin " should be limited to the constituent which excites the pancreas) causes more rapid improvement of anæmic animals than diet alone. It is shown by increase in rate of blood formation and of growth. There is no similarity between it and vitamin B.—W. M. B.

4277. Destruction of the Antiscorbutic Vitamin. V. K. La Mer (*Dissert.*, Col. Univ., New York, 1921, reprint, pp. 35).—Oxidation is regarded as an unimportant factor in the destruction of this vitamin by heat. The temperature coefficient is low (1·2); destruction follows the unimolecular law, and is reduced by adding alkali. The results are deduced from experiments on guinea-pigs, in which antiscorbutic material (tomato juice) previously heated was added to a basal diet, the manifestations of scurvy being also noted. This quantitative method is stated to give results accurate to $\pm 5\%$, but it is admitted that it has a restricted range.—W. D. H.

4278. Studi ed osservazioni sulla pellagra. A. Lustig and A. Franchetti (*Lo Sperimentale*, 1921, **75,** 187-276).—Pellagra is a disease of alimentary origin related to feeding on maize. Whether it is due to the deficiency of vitamin or to a complex of deficiencies is left open.—C. d. F.

METABOLISM

4279. The Physiological Effect of Undernutrition. G. Lusk (*Physiol. Rev.*, 1921, **1,** 523-52).—J. A. H.

4280. The Influence of Food Ingestion upon Endogenous Purine Metabolism—I. and II. W. C. Rose (*J. Biol. Chem.*, 1921, **48,** 563-74, 575-90).—I. A critical review of theories relating to endogenous purine metabolism. The author favours the view that a general stimulation of cellular catabolism involving both the nuclear purines and the hypoxanthine of muscle tissue by amino-acids is one of the important factors in endogenous purine metabolism. II. The excretion of uric acid under various diets is studied, and it is found that an increase in calories yields an increase in uric acid, whether the extra calories are given in the form of protein or carbohydrate. The increase is most marked with protein. The results generally support the author's view given in I., and are discussed at length.—T. A. W.

4281. Physiological Action of Some Protein Derivatives. VII. Their Influence on the Metabolism of Fasting Dogs. VIII. The Influence of Nucleic Acids on the Metabolism of Fasting Dogs. IX. Alkali Reserve and Experimental Shock. M. Ringer and F. P. Underhill. **X. The Influence of Nucleic Acid on the Metabolism of the Fasting Rabbit.** F. P. Underhill and M. L. Long. **XI. The Influence of Split Protein Products upon the Metabolism of Fasting Rabbits.** F. P. Underhill, P. Greenberg, and A. F. Alu (*J. Biol. Chem.*, 1921, **48,** 503, 523, 533, 537, 549-56).—VII. Fasting dogs are injected intravenously with the substance to be tested, and the urine is tested for N, P_2O_5, and creatine. The large amounts of these present are an evidence of induced catabolism of tissue. Both pure and impure proteoses are effective in this respect. Proteoses differ in their effect. Proteins, except gelatin, are also capable of this effect. Amino-acids, histamine, and *in vitro* autolysates have no effect. VIII. Yeast nucleic acid produces similar effects to proteoses, etc. Animal nucleic acids have no such effects. IX. Effects of the injection of various protein products on the alkali reserve of the blood in relation to a low blood-pressure. The results are variable, and further work is in progress. X. Injection of nucleic acid into circulation of fasting rabbits produces similar effects to those in dogs (see VIII.). XI. Although the rabbit does not react to injections of Witte's peptone and proteoses in a shock-like manner, it shows the usual increased catabolism. The action of these substances on catabolism is not, therefore, related to their toxicity.—T. A. W.

4282. Über das Verhalten der inaktiven Äpfelsäure im Organismus des Hundes und Kaninchens. M. Tomita (*Biochem. Zeit.*, 1921, **123,** 231-4).—Subcutaneous administration of *l*-malic acid to a rabbit resulted in the excretion of about 11% in the urine. When, however, the *dl*-malic acid was similarly administered to rabbits or dogs the acid excreted was dextrorotatory.—H. K.

4283. Über den Stickstoffansatz bei Fleisch- und Mehlkost. L. Dienes (*Biochem. Zeit.*, 1921, **123,** 128-43).—After emaciation more nitrogen is fixed from fleshy foods than from wheaten flour.—H. K.

4284. Relations of the Weight of Organs to Body Weight and Surface Area (in Dogs). G. N. Stewart (*Amer. J. Physiol.*, 1921, **58,** 45-52).—In a variety of dogs, the weight of the spleen was proportional to that of the body, the weight of the liver, stomach, intestines, kidneys, and lungs to the surface. The heart was more nearly proportional to the body weight than to the surface.—W. M. B.

4285. Über das Verhalten einiger cyclischer Verbindungen im menschlichen und tierischen Organismus. E. Schempp (*Zeit. physiol. Chem.*, 1921, **117,** 41-7).—Phenylacetic, *p*-nitrophenylacetic, phenylbromacetic, *a*-thiophenic, and pyromucic acids were given to various animals. The results confirm in the main the work of other investigators.—H. W. D.

4286. Dépense en CO_2 pendant la nage. A. D. Waller and G. de Decker (*Compt. rend. soc. biol.*, 1921, **85,** 902-3).—The output of CO_2 during swimming (the physiological cost of swimming) is very high.—J. H. B.

4287. Calcium and Phosphoric Acid Metabolism. K. Blühdorn (*Z. Kinderheilk.*, 1921, **29,** 43-55).—Large amounts of Ca as $CaCl_2$ or Ca lactate and of Na_2HPO_4 were given to children. They caused no ill effects, and in some instances a gain in weight. A portion of the excess of Ca given was retained, although the greater part was eliminated in the fæces. The P_2O_5 changes were in general parallel to the Ca changes, a change in the Ca balance being accompanied by a corresponding change in the P_2O_5 balance.—W. D. H. (*Chem. Abstr.*).

4288. Über den Einfluss des Calciummangels in der Nahrung auf den respiratorischen Grundumsatz. F. Pedotti (*Biochem. Zeit.*, 1921, **123,** 272-83).—Rats fed on a diet deficient in Ca show a diminished respiratory basal metabolism.—H. K.

4289. Ricerche di calorimetria. III. and IV. La tonalita termica nella coagulazione del sangue e del latte. V. La produzione di calore nei girini alimentati con tiroide o con timo. T. Gayda (*Arch. di Fisiol.*, 1921, **19,** 255-9, 261-6, 267-85; see Abstracts No. 3016, Vol. VI., p. 440, and No. 3905, Vol. VI., p. 578).—III. and IV. During the change of fibrinogen into fibrin, during the retraction of the clot, the transformation of caseinogen into casein, the precipitation of calcium caseinate, and the retraction of the latter, no "thermic tonality" is produced. V. In tadpoles fed on thyroid or thymus the production of heat is greater than in those fed on meat. In thymus-fed tadpoles the same fact can be observed, but in much slighter degree. This is due to the greater energy of the former. The increased heat production in thymus-fed tadpoles is small, and is attributed only to the greater amount of food which they ingest.—C. d. F.

SUGAR AND DIABETES

4290. Sugar in the Blood of Pigeons. H. Elizabeth Honeywell (*Amer. J. Physiol.*, 1921, **58,** 152-68).—Each bird has its own sugar level, about which it varies from day to day according to the external and internal environment. Inanition for 48 hours has no effect on it. After giving 1 to 3 gm. of glucose, the maximum rise occurs in 3 to 4 hours. It appears that the maximum occurs earlier the larger the amount of glucose given. Less than 1 gm. causes very little change.—W. M. B.

4291. Recherches sur le pouvoir glycolytique du sang mesuré in vitro. P. Mauriac and L. Servantie (*Compt. rend. soc. biol.*, 1921, **85,** 1067-8).—The glycolytic power of human blood does not vary perceptibly in health or disease.—J. H. B.

4292. Die Adrenalinhyperglykämie. Brösamlen (*Deutsch. Arch. f. klin. Med.*, 1921, **137,** 299-310).—Adrenaline causes in healthy persons hyperglycæmia (increase of 0·058%). Glycosuria is not marked. The glycæmia occurs 10 minutes after the injection, and the maximum is reached in about an hour. The increase is greater in Basedow's disease and lower in myxœdema. In diabetes the results were not constant, though they possibly help in distinguishing cases of pancreatic origin from those which are neurogenic—H. W.

4293. Blood-Sugar. The Amount of Circulating Sugar in the Blood in Diabetes, etc. R. Fitz and A. V. Bock (*J. Biol. Chem.*, 1921, **48,** 313-22).—Total blood-sugar of 7 normal persons varied between 2·5 and 7·54 g.; highest in the plasma—*i.e.*, 1·64 to 4·85 g. In cases of diabetes it varied from 6·8 to 15·0 g., with 5·2 to 10·8 g. in the plasma. Diabetic plasma is relatively richer in sugar than normal plasma. Corpuscular sugar is more or less fixed, and varies with the corpuscular content. Authors suggest that total blood-sugar is a more useful figure than sugar per 100 c.c. blood or plasma. Threshold at which sugar appeared in the urine of diabetic patients was between 5·2 and 5·37 g. of total plasma-sugar.—T. A. W.

4294. The Diagnosis of Latent or Incipient Diabetes. J. W. Sherrill (*J. Amer. Med. Assoc.*, 1921, **77,** 1779-85).—A record of determinations of blood-plasma sugar after ordinary meals and glucose meals. Clues to the explanation of obscure symptoms can often be obtained by this test.—C. L. E.

KIDNEY

4295. Eine gepufferte Durchströmungsflüssigkeit für die überlebend Froschniere. G. Barkan, P. Broemser, and A. Hahn (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 1-16).—The buffered perfusion fluid described has under a certain CO_2 tension the same reaction as the blood of the frog. This fluid can preserve the normal function of the kidneys during 8 to 9 hours, and if the fluid contains 0·06 to 0·07% glucose, the urine remains, nevertheless, free from sugar.—H. W.

4296. Über die Ausscheidung der Glucose durch die Glomeruli der überlebenden Froschniere. P. Broemser and A. Hahn (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 37-48).—If the perfusion fluid does not contain glucose, diuresis lasting 2 to 3 hours was observed. If the fluid contains more than 0·07% glucose, the glomerular epithelium is permeable for sugar, and the amount of urine increases considerably. When the sugar content in the fluid is 0·07 to 0·15%, the urine has no higher sugar content than the difference between the sugar content of the fluid and the normal sugar content of the serum.—H. W.

4297. Sulle alterazioni istologiche del rene prodotte dal raffreddamento. G. Ciccognardi (*Arch. per. le sc. med.*, 1920, **43,** 247-65).—After applications of cold to one kidney the other is almost equally affected. General perfrigerations are more injurious than local applications of cold. Functionally the changes consist of albuminuria with casts; histologically of small-celled infiltrations with degeneration of the epithelium of the tubules. These changes are visible within the first 24 hours; subsequently they diminish in intensity, and give place, at about the end of the 2nd week, to complete restitution.—C. d. F.

4298. Renal Efficiency Tests. J. D. Comrie (*Lancet*, 1921, ii., 1150-3).—If blood urea is estimated first, then urea concentration in urine, and the phenolsulphonephthalein test (most valuable) is performed, trustworthy information is obtainable. Permanent high blood urea and high arterial pressure often go together, but the two are not parallel.—W. D. H.

4299. Day and Night Urine during Complete Rest, Laboratory Routine, Light Muscular Work, and Oxygen Administration. J. A. Campbell and T. A. Webster (*Biochem. J.*, 1921, **15,** 660-4).—Total N was decreased at night under all conditions. Ammonia was increased. Creatinine, urea, uric acid, and amino-acids were excreted in greater amounts during the day than during the night. Acidity of the urine was higher during the night under all conditions, and is possibly due to delayed excretion of certain fixed acids formed during the day. Activity out of bed hastened this excretion. The phosphate tide at night is due to the increased acidity of the urine, and is not connected with muscle or nerve metabolism. Administration of 35 to 40% of oxygen does not affect the composition of the urine.—J. A. H.

4300. Action diurétique des sels de calcium. Mécanisme de cette action. L. Blum, E. Aubel, and R. Hausknecht (*Compt. rend. soc. biol.*, 1921, **85,** 950-2).—Ca given as chloride to œdematous patients acts as a diuretic. It causes Na to be removed from the body by the kidney.—J. H. B.

ENDOCRINE SYSTEM

4301. La thyroïdectomie chez les bovins. E. Hug (*Compt. rend. soc. biol.*, 1921, **85,** 953-4).—Thyroidectomy was carried out on 3 bull-calves at the age of 2 to 3 months. They grew normally, but 12 months later weighed about 100 kg. less than controls (which weighed 380 kg.). Sexual characteristics developed normally, and blood Ca was normal.—J. H. B.

4302. The Influence of Thyroparathyroidectomy upon Blood-Sugar Content and Alkali Reserve. F. P. Underhill and C. T. Nellans (*J. Biol. Chem.*, 1921, **48,** 557-61).—Thyroparathyroidectomy lowers the blood-sugar content, and (after the onset of tetany) the alkali reserve.—T. A. W.

4303. Flagellated Thyroid Cells in the Dogfish. E. V. Cowdry (*Anat. Rec.*, 1921, **22,** No. 5).—Each follicular cell is provided with a flagellum which extends into the colloid substance.—W. D. H. (*W. I.*).

4304. Effects of Parathyroid and Thyroid Feeding in the White Rat. A. T. Cameron and J. Carmichael (*Amer. J. Physiol.*, 1921, **58,** 1-6).—Large doses of parathyroid produced no definite effect on growth and no hypertrophy of organs. Liver also in large quantities produced no effect on development. Thyroid feeding, on the contrary, besides partially inhibiting increase in weight, was accompanied by hypertrophy of kidneys and heart. Several of the thyroid-fed rats developed tetany.—E. M.

4305. Effect of Thyroid Feeding on Adult White Rats. A. T. Cameron and F. A. Sedziak (*Amer. J. Physiol.*, 1921, **58,** 7-13).—After feeding for about 2 months with a diet containing dried thyroid gland, there was a gain of weight in liver, kidneys, heart, spleen, lymph glands, and adrenals, while the average body weight and that of the thyroids diminished as compared with control animals. Attention is drawn to the similar condition of organs in hyperthyroidism and following the administration of thyroid, more particularly to the hypertrophy of heart and lymph tissues in both instances.—E. M.

4306. Über Schilddrüsenfütterung an Wirbellosen. R. H. Kahn (*Pflüger's Arch.*, 1921, **192,** 81-92).—No effect on growth, differentiation, or metamorphosis could be obtained when *Corethra plumicornis*, *Ecdyurus forcipula*, or *Tenebrio mollitor* larvæ were fed on thyroid or on the commercial preparation "Jodalbazid."—C. L. E.

4307. Die Bedeutung des Thymus für die Entwicklung der männlichen Keimdrüsen. E. Leupold (*Beitr. z. path. Anat. u. z. allg. Path.*, 1920, **67,** 472-91).—The thymus has a determining influence upon the development of the testes in extra-uterine life, and particularly during childhood and puberty. The size of both thymus and testes is constitutionally determined. If the involution of the thymus is accelerated, the testes waste, and may undergo atrophy. The influence of the thymus on the full maturation of the testes appears to act through the intermediation of the adrenals. If the thymus undergoes involution too early, the adrenals are insufficient *per se* to further the development of the testes or to prevent their atrophy. On the other hand, in cases of hyperplasia of the thymus, provided the adrenals are normal, it continues to influence the growth of the testes, which may reach a very high degree of maturity. —C. d. F.

4308. Modifications expérimentales de la répartition de l'azote urinaire par injection sous-cutanée d'adrénaline. J. Brel (*Compt. rend. soc. biol.*, 1921, **85,** 1057-8).—Subcutaneous injection of 1 mg. adrenaline into rabbits produces a change in the distribution of urinary nitrogen. If the rabbits are normally fed and healthy, there is a constant rise of urea N and a slight rise of the ratio of amino-N to total N. In fasting animals amino-acids may appear in the urine.—J. H. B.

4309. Über die Wirkung des Adrenalins auf die Drüsen der Krötenhaut. H. Wastl (*Zeit. Biol.*, 1921, **74** [N.F. **56**], 76-80).—Adrenaline has a secretory effect on the skin glands of *Bufo vulgaris*. The limiting doses were determined.—H. W.

4310. Endocrine Glands. VI. The Denervated Heart in Relation to Adrenal Secretion. W. B. Cannon and D. Rapport (*Amer. J. Physiol.*, 1921, **58,** 308-37).—With adrenals intact, the average increase in rate of the denervated heart due to splanchnic stimulation was 29 per minute. After removal of adrenals it was only 6. The cause of the increase in the latter case was proved not to be due to rise of arterial pressure, nor to changes in venous pressure, nor improved circulation, nor by warmer blood, nor accessory adrenal tissue. It disappeared, however, when the hepatic nerves were cut. "Redistribution of blood in the body" was excluded by the use of an animal in which the carotids, brachials, and renal arteries, and the aorta below the renals were tied and the mesenteric and hepatic nerves cut, so that the only abdominal viscera innervated were the adrenals. Reflex acceleration of the denervated heart (26 per minute) occurred, although the change in blood-pressure was very small. Injection of adrenaline at the rate of 0·0007 mgm. per kilo per minute was found necessary to bring the heart rate of an adrenalectomised animal to the normal. During this administration, no increase was produced by reflex stimulation. Comparing the actual increase in rate on reflex stimulation with that given by adrenaline injections, it was found that the output from the adrenals was between 0·0032 and 0·0037 mgm. per kilo per minute, 10 times the amount found by tests outside the body.—W. M. B.

4311. Endocrine Glands. VII. The Reflex Centre for Adrenal Secretion. W. B. Cannon and D. Rapport (*Amer. J. Physiol.*, 1921, **58,** 338-52).—Removal of the brain down to a few mm. below the C. quadrigemina leaves the reflex intact. Slowing of the rate of the denervated heart when nerves are stimulated is regarded as showing an inhibition of the normal continuous action of the adrenals, since their removal, even when no fall of blood-pressure occurs, lessens the heart rate. Stimulation of the central end of the vagus or depressor nerves causes slowing of the denervated heart. This disappears after section of the brain stem in the position stated above, and is absent when the adrenals are removed. It appears that the centre for adrenal secretion lies near the upper edge of the floor of the fourth ventricle, and that it is subject to both excitatory and inhibitory influences.—W. M. B.

4312. Endocrine Glands. VIII. Effects on the Denervated Heart of Stimulating the Liver Nerves. W. B. Cannon and J. E. Uridil (*Amer. J. Physiol.*, 1921, **58,** 353-64).—Stimulation of the hepatic nerves causes an increased rate in the denervated heart, the effect having a longer latent period and lasting longer than the adrenaline effect. Stimulation of the hepatic nerves causes a rise of blood-pressure which long outlasts the period of stimulation. Asphyxia has a very powerful depressant effect on the result, which is also very small in the fasting animal, but much greater during the digestion of meat.—W. M. B.

4313. Über eine neue Funktion der Nebennierenrinde. Y. Tokumitsu (*Mitt. a. d. path. Inst. d. kais. Univ. Sendai, Japan*, 1921, **1,** 161-210).—Hypertrophy of the suprarenal cortex follows ligature of the pancreatic duct in the rabbit. Glycosuria is observed if this hypertrophied cortex be removed, but the effect disappears on transplantation of a portion of the cortex. The suprarenal cortex, therefore, assists the islets of Langerhans in maintaining a normal sugar metabolism (see Abstract No. 462, Vol. VI., p. 71).—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4314. Physiologie der Drüsen. XLVII. Die Beziehung zwischen Thymus, Milz, und Knochenmark. L. Asher and G. Matsuno (*Biochem. Zeit.*, 1921, **123,** 27-50).—The hæmoglobin and white corpuscular content of blood was examined after extirpation of the thymus and spleen. Stimulation of the bone-marrow of normal rabbits by hydrocyanic acid or by bleeding leads to a fall in the hæmoglobin, an increase of lymphocytes, but a decrease in the leucocytes. Extirpation of the thymus inhibits this response almost completely. Extirpation of the spleen, however, has little effect.—H. K.

4315. Le modificazioni anatomiche della milza consecutive a stimizzazione. G. Baggio (*Arch. di Fisiol.*, 1921, **19,** 299-315).—After extirpation of the thymus in rabbits 20 to 80 days old, the spleen weight was diminished in 78%. The average diminution

was of 182 mg. In 62·5% of the animals the body weight fell. A diminution in both spleen and body was found in 60%. No histological change could be detected in the spleens.—C. d. F.

4316. Zur Kenntniss des hypophysären Zwergwuchses. A. Priesel (*Beitr. z. path. Anat. u. z. allg. Path.*, 1920, **67,** 220-74).—At the autopsy of a dwarf who had reached the age of 91 the thyroid and adrenals were small, the lateral parathyroids large, and genital organs hypoplastic. The anterior lobe of the pituitary was extremely small; the posterior lobe was situated outside the sella turcica; the junction between the two lobes was incomplete. The author lays stress on this fact, which probably had an injurious influence upon the nutritive conditions of the anterior lobe and caused its atrophy. The primary cause of these alterations appears to have been the anomalous ossification of the sphenoid.—C. d. F.

4317. Die Hypophyse bei Hypothyreose, nebst Bemerkungen über die Schwangerschaftshypophyse. W. Berblinger (*Mitt. a. d. Grenzgeb. d. Med. u. Chirurg.*, 1921, **33,** 92-112).—Hyperthyroidism leads to an increase in the chief cells of the pituitary similar to that occurring during pregnancy or, in experimental animals, as a result of injection of fœtus or placenta.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4318. Pancreas und Hypophyse. E. J. Kraus (*Beitr. z. path. Anat. u. z. allg. Path.*, 1921, **68,** 258-77).—By means of almost complete extirpation of the pancreas it is possible to cause in cats changes of the pituitary like those seen in diabetes mellitus. In the anterior lobe there is an almost complete disappearance of the oxyntic cells. The surviving ones are irregularly distributed and deformed. The weight of the hypophysis is diminished. These alterations increase in proportion to the defect of the pancreatic islets. Hence the conclusion that the oxyntic cells of the pituitary take part in the metabolism of sugar, and are dependent upon the islets. The pars intermedia and pars nervosa also show atrophic changes. The thyroid, after removal of the pancreas, increases in weight and activity, but later undergoes some atrophy. In the adrenals the lipoids disappear from the cortex, the chromaffine reaction from the medulla. There is also sometimes atrophy of the seminiferous tubules and of the interstitial cells of the testis and ovary. The pineal body likewise undergoes atrophy. The parathyroid glands appear to be least affected.—C. d. F.

REPRODUCTIVE SYSTEM

4319. Horse Semen. J. Yamane (*J. Coll. Agric. Hokkaido Imp. Univ.*, 1921, **9,** 161-236).—Specific gravity, chemical composition, effect of various ions on motility and agglutination are the main subjects treated. There appears to be nothing new in the paper, only a multitude of data.—W. D. H. (*Chem. Abstr.*).

4320. Mammalian Spermatogenesis. I. Opossum. T. S. Painter (*J. Exp. Zool.*, 1922, **35,** No. 1).—The spermatogonia contain 22 chromosomes. Many other details interesting to cytologists are given, and different counts by other observers are discussed.—W. D. H. (*W. I.*).

4321. Sur l'existence d'une glande interstitielle dans le testicule des poissons. R. Courrier (*Compt. rend. soc. biol.*, 1921, **85,** 939-41).—The testicles of the fish (*Gobius, Hemichromis bimaculata, Callionymus lyra*, etc.) contain cells of a glandular character, probably subserving the function of interstitial cells in mammals.—J. H. B.

4322. Sur le rôle du noyau dans la sécrétion epididymaire. J. Benoit (*Compt. rend. soc. biol.*, 1921, **85,** 946-8).—The nuclei of the cells of the epididymis produce substances which are excreted into the cell protoplasm and thence into the tube. These provide nutrition for the spermatozoa.—J. H. B.

4323. Über hormonale Sterilisierung des weiblichen Tierkörpers. L. Haberlandt (*Münch. med. Woch.*, 1921, **68,** 1577-8).—The author claims to have produced sterility in female rabbits and guinea-pigs lasting up to 3 months by transplanting into the

muscular tissue of the back some ovarian tissue from pregnant rabbits and guinea-pigs respectively. This is evidence for the view that the function of the corpus luteum is to prevent the interruption of pregnancy by a further conception.—J. H. B.

4324. Effect of Undernourishment on Mammalian Ovary and the Sexual Cycle. L. Loeb (*J. Amer. Med. Assoc.*, 1921, **77,** 1646-8).—C. L. E.

4325. The Carbohydrate Content of the King Salmon Tissues during the Spawning Migration. C. W. Greene (*J. Biol. Chem.*, 1921, **48,** 429-36).—The muscle tissue contains no glycogen at any stage of the migration; liver contains a variable amount at the beginning (0·2 to 0·66%), which falls to 0·07% at end of migration. The ovaries contain a more or less constant amount, about 0·09%.—T. A. W.

4326. Über Hermaphroditismus. G. Mittasch (*Beitr. z. Path. Anat. u. allg. Path.*, 1920, **67,** 142); H. v. Keussler (*ibid.*, 416); H. Poll (*ibid.*, 40).—In the two first papers cases of hermaphroditism in man are described. In the second paper a new classification is proposed, and doubt thrown on Steinach's views. The third paper deals with the testes of two hybrids from peacock and guinea-hen. They showed degeneration of seminal tubes and an enormous overgrowth of interstitial tissue simulating tumours, but there were no metastases, and so the question of malignancy was left open. Similar appearances have been described in the ovo-testis of human hermaphrodites, and the defect may be due to an original defect of the gametes, or of the product of their fusion. —W. D. H. (*Med. Sci.*).

4327. Is the Fertile Tortoise-Shell Tom-Cat a Modified Female? C. C. Little (*J. Gen.*, 1920, **10,** 301-2).—A case in which the F_1 generation of a male tortoise-shell cat crossed with a normal female produced male offspring. On cytological grounds each animal would be expected to possess no odd sex chromosome characteristic of the normal male, so that females only would result. On the other hand, it is difficult to explain the result as due to hormone action.—T. R. P. (*Ber. ü. d. ges. Physiol.*).

4328. Studies on Abortuses. A Survey of Pathological Ova in the Carnegie Embryological Collection. F. P. Mall and A. W. Meyer (*Contrib. to Embryology*, No. 56, Carnegie Inst., Washington, 1921, Publ. 275, pp. 364).—W. D. H.

4329. Sur des fécondations hétérogènes. A. Labbé (*Compt. rend.*, 1921, **173,** 942-5). —The eggs of *Sabellaria alveolata* L. and of *Lineus longissimus* were used with the sperm from batrachians, fish, crustaceans, and molluscs. The results were very irregular, but it is concluded that fertilisation even from a distant species can prevent the egg from dying without transmitting to it paternal characters. Also, that the actual penetration of the foreign sperm is not necessary, but that mere contact will produce activation, and that penetration, when it does occur, does not necessarily cause activation.—Ha. W.

4330. Production of Syringomyelocœle in the Tadpole by X-Rays. W. M. Baldwin (*Anat. Rec.*, 1921, **22,** No. 5).—Eggs of the frog and toad were rayed by X-ray energy emanating from a Coolidge tube; 25% of the eggs showed syringomyelocœle. The defects noted comprised an anomalous development of the heart, dilated bloodvessels and pericardium, a static circulation, and a marked dilatation of the neurocœle at the segmental levels marking the junction of body and tail. The dilatation of the neurocœle is accompanied by a pronounced thinning of the dorsal wall of the neural tube, by a lateral position of the myotomes, and by a failure of the neural arch halves to fuse. W. D. H. (*W. I.*).

4331. Les constituants chimiques de l'œuf et leur rôle dans le développement embryonnaire chez la grenouille rousse (Rana temporaria). E. Fauré-Fremiet and Du Vivier de Streel (*Bull. soc. chim. biol.*, 1921, **3,** 476-82).—After fertilisation and during autotrophic development, the egg shows a diminution in its lipoid, glycogen, and vitellin content, and a gain in water. Growth during this period is not due merely to the imbibition of water, but to the hydration of vitellin and its transformation into an organised substance.—R. K. S. L.

MILK

4332. Excess Protein and Mammary Secretion. G. A. Hartwell (*Biochem. J.*, 1921, **15,** 563-74).—Diets containing 40% edestin, blood or egg albumin, gelatin or home-made gluten, fed to lactating rats are detrimental, after the 10th or 11th day, to the young. Fish and meat proteins may have this effect. The addition of edestin (and caseinogen) to bread diet produces maximum growth of the young. The high protein diets also cause cessation of milk secretion, leading to loss of weight in the litter. During lactation on these diets increase of weight of the mother is injurious to the young; loss of weight may be beneficial; in this gelatin is an exception. There is no deficiency of accessory food factors.—J. A. H.

4333. Citric Acid Content of Milk and Milk Products. G. C. Supplee and B. Bellis (*J. Biol. Chem.*, 1921, **48,** 453-62).—Citric acid varies in the milk from different cows; it is not destroyed by heating the milk, and is present in condensed milk and milk powders. There is no parallelism between the citric acid content and antiscorbutic properties of dried milks. Citric acid decreases in aged acid milk, more so in fresh than in pasteurised milk.—T. A. W.

4334. Milk Yield of Ayrshire and Other Cows. J. F. Tocher (*Trans. Highland Agr. Soc.*, 1919 [5], **31,** 237-56; *Scot. J. Agric.*, 1919, **2,** 343-53). **Variability of Cow's Milk.** H. S. H. Wardlaw (*Proc. Linn. Soc. N.S. Wales*, 1917, **42,** iv., 815-65). **Influence of Ca and P in Feed on Milk Yield.** E. B. Meigs and T. E. Woodward (*J. Dairy Sci.*, 1921, **4,** 185-217). **Milk Yields on Pasture and Stall Feeding.** J. J. O. de Vries (*Verslag Ver. Exploit Proefzuivelboerderij Hoorn*, 1917, 22-6; *Exp. Stat. Rec.*, **44,** 73).—Titles taken from abstracts in *Chemical Abstracts*, 1921, **15,** 2939-40.—W. D. H.

4335. Studies in Milk. R. S. Williams (*Lancet*, 1921, ii., 1386-8).—Data showing that clean milk can be obtained by hygienic precautions.—W. D. H.

PHARMACOLOGY AND TOXICOLOGY

4336. Rational Empiricism. R. D. Rudolf (*Canadian Med. Assoc. J.*, Sept., 1921, reprint, 4 pp.).—A defence of empiricism (which often anticipates science), if based on practical experience, which is really a kind of experiment.—W. D. H.

4337. Localisation des poisons et des infections sur les systèmes neuromusculaires de l'homme suivant leur chronaxies. G. Bourguignon (*Compt. rend.*, 1921, **173,** 1136-8).—Poisons pick out certain neuromuscular groups, and these, the author has found, have the same chronaxie. In the upper limb the most sensitive groups are those with big chronaxie. Thus lead picks out the muscles supplied by the musculo-spiral nerve, with the exception of the brachio-radialis, which has a low chronaxie. In the lower limb it is the nerves and muscles of medium chronaxie which are the most sensitive. All the nerves and muscles in a limb which have the same chronaxie have also the same functions and the same pathological aptitudes.—Ha. W.

4338. The Influence of the Electric Current on the Absorption of Drugs. O. Inchley (*J. Pharm. Expt. Ther.*, 1921, **18,** 241-56).—A paper on this subject from a British pharmacological laboratory is welcome. The investigation was undertaken to determine within what limits the electric current facilitates absorption from the skin. Both positive and negative ions can be made to be absorbed through the skin or mucous membrane by means of the electric current if solutions of drugs are applied at the appropriate electrode. The current is conveyed through the body by the tissue ions, and has no influence on the direction of the foreign ion after the latter has passed through the skin. [Turrell, attacking the problem from a somewhat different angle, has come to the same conclusion (*Proc. Roy. Soc. Med.*, 1921, **14,** 41-50)].—J. A. G.

4339. Action of Bryonia alba on Heart and Circulation. A. Gradinescu (*Bull. rec. sci. acad. Roumaine*, 1920, **6,** 167-70).—The hæmostatic bryony root causes decreased cardiac activity, fibrillation, and death; the symptoms are variable with the dose and animal used; at a concentration of 1: 100,000 it is vaso-constrictor; in cats and dogs it lowers blood-pressure.—W. D. H. (*Chem. Abstr.*).

4340. Erythopoietic Action of Germanium Dioxide. F. S. Hammett and J. E. Nowrey, Junior (*J. Exp. Med.*, 1922, **35,** No. 2).—In rats after injections, a rise of red but not colourless corpuscles took place. Bone-marrow and liver (autopsy) seem to be responsible. The substance is non-toxic, and it may prove useful therapeutically.—W. D. H. (*W. I.*).

4341. On the Influence of Colloids on the Action of Non-Colloidal Drugs—III. and IV. W. S. v. Leeuwen and A. v. Szent-Györgyi (*J. Pharm. Expt. Ther.*, 1921, **18,** 257-69, 271-91).—Further experiments dealing with the substances in serum, brain, etc., which are able to inhibit the action of certain alkaloids. The results seem to be so inconstant that it would seem unwise at present to found hypotheses upon them. One point, however, seems to have emerged more clearly. The " absorption of pilocarpine by rabbit serum " is inhibited by ether. The authors suggest that this may be a phenomenon allied to the discovery by Dale that histamine is much more poisonous for the narcotised than for the normal cat. For suggested bearings of these experiments upon anaphylotoxin, the original papers may be consulted.—J. A. G.

4342. Standardisation of Belladonna Extracts. W. S. v. Leeuwen and P. H. Maal (*J. Pharm. Expt. Ther.*, 1921, **18,** 313-8).—Commercial samples were examined physiologically and chemically. Estimation of total alkaloids did not correspond with physiological activity. It is suggested that where accurate prescriptions are wanted, extract of belladonna should be standardised both chemically and physiologically. (Or would not a solution of atropine sulphate do as well ?)—J. A. G.

4343. Action of Various Lactones on Worms. L. Lautenschläger (*Ber. deut. pharm. Ges.*, 1921, **31,** 279-91).—Experimental support is adduced of Trendelenburg's theory (*Arch. Expt. Path. Pharm.*, 1915, **79,** 190) that the anthelmintic action of santonin and similar compounds is due to the lactone structure.—W. D. H. (*J. C. Soc.*).

4344. Etude pharmacodynamique de l'adrénalone. E. Jaeger (*Compt. rend. soc. biol.*, 1921, **85,** 910-2).—Adrenalone acts in every way like adrenaline, except that the " ergotoxin reversal " is incomplete.—J. H. B.

4345. Poison of Imori or Boje-Triton pyrrhogaster. S. Matsusaki and I. Kabeda (*Tokio Iji Shinji*, No. 2064, 455-60; *Jap. Med. Lit.*, 1921, **6,** 4-5, 10-1).—The poison is best obtained by extraction of the skin with glycerol, but it is also present in muscles and internal organs. Two toxic principles are described, one hæmolytic, the other neurotoxic. Details are given as to lethal dose, etc. The poisonous effects are most marked in warm-blooded animals.—W. D. H. (*Chem. Abstr.*).

4346. Modifications des variations leucocytaires du choc peptonique consécutives à des modifications de l'excitabilité du système nerveux organo-végétatif. L. Garrelon and D. Santenoise (*Compt. rend. soc. biol.*, 1921, **85,** 903-5).—If peptone is injected into an animal under chloralose, there is a production of shock manifested by a fall in the polymorph cell count. If pilocarpine is injected with the peptone, this fall is intensified, and if atropine is injected with the peptone no fall occurs.—J. H. B.

4347. Contribution à l'étude des reactions vasculaires et nerveuses consécutives à l'injection de peptone, à l'aide d'un complexe colorant. J. Gautrelet (*Compt. rend. soc. biol.*, 1921, **85,** 915-6).—In a normal dog, intravenous injection of thionine produces no fall of blood-pressure, whereas nigrosine produces a lasting intense fall. The fall produced by nigrosine is intensified by a previous injection of thionine. But in a dog which has previously received an injection of peptone, the injection of thionine, followed by nigrosine, produces no fall of pressure; nigrosine alone, however, causes the fall of pressure. Transfusion of blood from a peptonised dog to a normal dog prevents in the normal dog the fall of pressure produced by thionine-nigrosine.—J. H. B.

4348. Anaphylaxie active aux arsénobenzènes chez le cobaye. C. Flandin and A. Tzanck (*Compt. rend. soc. biol.*, 1921, **85,** 993-4).—0·02 gm. sulpharsenol injected into the heart of a guinea-pig produces no symptoms; 3 days later 0·002 gm. are injected, and the animal suffers from a crisis which the authors consider an anaphylactic shock. The animal, however, never dies.—J. H. B.

PLANT PHYSIOLOGY

GENERAL

4349. On Crystals in Some Australian Timbers. R. T. Baker (*Proc. Roy. Soc. N.S. Wales*, 1918, **51,** 435-44).—Describes and figures crystals of calcium oxalate in the wood parenchyma of a number of Australian trees belonging to many different natural orders.—C. W.

4350. The Physiological Anatomy of the Plants of the Indian Desert. T. S. Sabnis (*J. Indian Bot.*, 1921, **2,** 217-35).—Deals with plants of the N.O. *Cyperaceæ*.—C. W.

4351. Splachnaceenstudien. I. Entomophilie und Spaltöffnungsapparat. F. von Wettstein (*Österr. bot. Zeit.*, 1921, **70,** 65-77).—The stomata of the fruit of these mosses do not function for respiration, but a kind of indol substance exudes from them which is attractive to some insects.—W. S. (*Ber. ü. d. ges. Physiol.*).

4352. Über den Wert des Ostwaldchen Farbenatlasses bei Blattfarbbestimmungen und Vorschläge zu dessen Ausbau. K. Westermeier (*Beih. Bot. Centr.*, 1921, **38,** 266-72).—W. S.

PHYSICAL AND CHEMICAL

4353. Temperatur und Capillaraktivität (Erwiderung). B. v. Issekutz (*Biochem. Zeit.*, 1921, **122,** 301-2).—Winterstein (Die Narkose) has criticised some of the author's results (Abstract No. 2649, Vol. III., p. 459). The author points out that it is due to a misunderstanding brought about by the author's method of calculating or expressing his results.—H. K.

4354. Ein Beitrag zur Frage der chemischen Konstitution der Protoplasma. H. Walter (*Biochem. Zeit.*, 1921, **122,** 86-99).—Biedermann has shown that protoplasm of higher plants is not easily digested by proteoclastic enzymes unless it is previously extracted with alcohol, ether, and chloroform. The author finds same holds true of protoplasm of sclerotia and of plasmodia of the myxomycete *Fuligo varians*. After previous extraction by these lipoid solvents it is completely digested by trypsin and partially by pepsin. He concludes normal resistance of the protoplasm to these digestive enzymes is due to the presence throughout the protoplasm of lipoids in a very fine state of dispersion, and that evidence is against the localisation of these lipoids in a peripheral protoplasmic layer.—J. H. P.

4355. Physikalisch-chemische Charakterisierung des Lignins aus Winterroggenstroh. E. Beckmann and O. Liesche (*Biochem. Zeit.*, 1921, **121,** 293-310).—Lignin preparations obtained by extraction of dry, ripe straw of winter rye with NaOH in methyl alcohol, evaporating extract under reduced pressure, and precipitating with HCl in the cold. Analytical data had previously suggested a molecular weight of 764·6 and equivalent weight of 382·3. Molecular weight determinations by effect upon the freezing-point of phenol and boiling-point of acetic acid are in agreement. From the determination of molecular weight of sodium lignate in solutions of different concentration (0·1 and 0·2 N) it appears to undergo dissociation in solution. $C_{40}H_{42}O_{15}Na \rightleftharpoons C_{40}H_{42}O_{15}Na' + Na'$. Determination of the conductivity for solutions of the same concentration are in agreement with this. In more dilute solution, further dissociation seems to occur; thus $C_{40}H_{42}O_{15}Na' \rightleftharpoons C_{40}H_{42}O_{15}'' + Na'$.—J. H. P.

4356. The Penetration of Electrolytes into Gels. III. The Influence of the Concentration of the Gel on the Coefficient of Diffusion of Sodium Chloride. W. Stiles and G. S. Adair (*Biochem. J.*, 1921, **15,** 620-8).—With increasing concentration of gel the coefficient of diffusion of sodium chloride diminishes. With gel concentrations above 2% the relation between gel concentration and coefficient of diffusion is approximately linear; with lower concentrations the relation is approximately an exponential one.—W. S.

4357. The Penetration of Electrolytes into Gels. IV. The Diffusion of Sulphates in Gels. W. Stiles (*Biochem. J.*, 1921, **15,** 629-35).—The coefficients of diffusion of Na_2SO_4, K_2SO_4, $(NH_4)_2SO_4$, and $MgSO_4$ in gels of 0·5% agar-agar are very close to, though slightly less than, the corresponding coefficients in pure water. The coefficients in 10% gelatine are about 25% less than in 0·5% agar-agar. Increase in temperature from 0° to 20° C. increases the diffusion coefficient about 1·76 to 2·2 times. The comparatively small absorption of sulphates by plant tissue cannot be explained as due to retarded diffusion through a protoplasmic gel.—W. S.

4358. Variations dans la composition chimique des fucus. L. Lapicque and L. Emerique (*Compt. rend. soc. biol.*, 1921, **85,** 172-5).—The composition of Laminareæ shows an annual periodicity, the carbohydrate increasing in the summer and the ash constituents decreasing. *Fucus serratus* is similar, except that in June it contains a large quantity of mineral matter. *F. vesiculosus* exhibits a minimum of soluble ash constituents in June. *F. platycarpus* has a higher ash content. The analytical results are tabulated.—W. S.

4359. The Pectic Substances of Plants. II. Preliminary Investigation of the Chemistry of the Cell Walls of Plants. D. H. F. Clayson, F. W. Norris, and S. B. Schryver (*Biochem. J.*, 1921, **15,** 643-53).—N sodium hydroxide extracts from tissues a substance (or substances) with properties distinct from pectic substances, and which are allied to "hemicelluloses." These give a blue colour with iodine, and reduce Fehling's solution only after hydrolysis with acid. Concentrated HCl produces furfural, and the pentose content varies between 40 and 85%. These substances are reserve carbohydrates, and are termed *cytopentans*. After extraction of tissues with warm caustic soda, treatment of the residue with *warm* ammonium oxalate and acidification of the solution yields "cytopectic acid," previously termed "pectin." Cytopectic acid from many sources appeared to be identical, and contained 40 to 42% of pentose.—J. A. H.

ENZYME ACTION

4360. Über den Abbau des l-Tryptophans durch Proteusbakterien. T. Sasaki and I. Otsuka (*Biochem. Zeit.*, 1921, **121,** 167-70).—In presence of glycerol and Henderson's phosphate mixture as a buffer, *B. proteus* converts *l*-tryptophane into *d*-indolelactic acid.—H. K.

4361. Über den Abbau des d,l-α-Naphthalanins durch Proteusbakterien. T. Sasaki and J. Kinose (*Biochem. Zeit.*, 1921, **121,** 171-4).—The synthesis of α-naphthalanine by Sasaki's method is described, and its conversion by *B. proteus* into *d*-naphthyllactic acid.—H. K.

4362. Die Abhängigkeit der antiseptischen Wirksamkeit der Hg-Verbindungen vom Dissoziationsgrade der Hg-Ionen. G. Joachimoglu (*Bicchem. Zeit.*, 1921, **121,** 259-61).—The inhibitory effect of mercuric ions on yeast fermentation is used as the basis of a lecture demonstration. The variation in volume of the CO_2 evolved serves as a measure of the degree of inhibition.—H. K.

4363. Über den bakteriellen Abbau des l-Leucins. M. Arai (*Biochem. Zeit.*, 1921, **122,** 251-7).—*l*-Leucine submitted to *Proteus vulgaris* on a suitable medium gave the corresponding nitrogen free *d*-hydroxy-acid, but *B. subtilis* gave the lævo-acid. By varying the nutrient medium *P. vulgaris* gave isoamylamine.—H. K.

4364. Über die Bestimmung zell- und keimschädigender Substanzen in dünnen Lösungen auf biologischem Wege—II. A. Schnabel (*Biochem. Zeit.*, 1921, **122,** 295-300).

—A graphic modification of the author's previously described (Abstract No. 3158, Vol. V., p. 502) method for determining the concentration of substances which inhibit the methylene blue reducing capacity of bacteria.—H. K.

4365. Bemerkungen zu der Abhandlung von Emil Baur und Eugen Herzfeld "Über Gärung ohne Hefe." A. Bau (*Biochem. Zeit.*, 1921, **122,** 303-6).—A criticism of the claims of Baur and Herzfeld (Abstract No. 2061, Vol. VI., p. 297).—H. K.

4366. Über die alkoholischen Gärung bei Gegenwart von kohlensaurem Kalk. J. Kerb and K. Zeckendorf (*Biochem. Zeit.*, 1921, **122,** 307-14).—The authors are unable to confirm Fernbach and Schoen (Abstract No. 2383, Vol. V., p. 375) on the production of pyruvic acid as an intermediate product in the fermentation of sugar in the presence of $CaCO_3$. Its production must have been as a by-product due to oxidation of lactic acid by use of an atypical yeast.—H. K.

4367. Über die Einwirkung von Salzen auf die Entfärbung des Methylenblaus durch verschiedene Hefesorten. H. Kumagawa (*Biochem. Zeit.*, 1921, **121,** 50-163).—Reducing action of different races of yeast upon methylene blue in the presence or absence of metallic salts is such a variable quantity that it seems to be largely influenced by the physiological condition of the yeast (its previous nutrition, etc.) at the time of the experiment. Any connection of the reducing activity of the yeast with the complex of zymatic enzyme is problematical.—J. H. P.

4368. Über die Umsetzung der d-Galaktose nach der zweiten Vergärungsform. M. Tomita (*Biochem. Zeit.*, 1921, **121,** 164-66).—*d*-Galactose, like the three other fermentable hexoses, can give rise to acetaldehyde and glycerin in molecular proportions when fermented under suitable conditions.—J. H. P.

4369. Neue Klassen von Stimulatoren der alkoholischen Zuckerspaltung. VII. Über chemisch definierte Katalysatoren der Gärung. C. Neuberg, Elsa Reinfurth, and Marta Sandberg (*Biochem. Zeit.*, 1921, **121,** 215-34).—*a*-Ketonic acids accelerate fermentation, and in presence of yeast and absence of sugar lose CO_2 and give next lower aldehyde. These aldehydes appear to be true accelerating agents of fermentation, and to act in their capacity as H acceptors. Whole series of other bodies capable of acting as H acceptors also accelerate reduction. Possibly many accelerating actions on yeast growth and fermentation, as yet attributed to vitamins, are really due to H acceptor substances contained in the vitamin extract.—J. H. P.

4370. Kultur-Versuche mit Soya-Bohnen. II. Vorkommen von Urease in anderen Pflanzenteilen als in Samen. D. H. Wester (*Biochem. Zeit.*, 1921, **122,** 188-92).—Soya beans have been cultivated in Holland, 1917 to 1920, with varying results. Yield not always satisfactory, and ripening of crop uncertain in this climate. Seeds of 1917 crop were germinated, and all parts seedling contained the enzyme urease.—J. H. P.

4371. Über die Bildung von Acetaldehyd und die Verwirklichung der zweiten Vergärungsform bei verschiedenen Pilzen. C. Neuberg and Clara Cohen (*Biochem. Zeit.*, 1921, **122,** 204-24).—In further confirmation of authors' view that acetaldehyde occurs as normal intermediate step in alcoholic fermentation of sugar by yeast, authors have examined decomposition of sugar by various fungi in presence of sodium or calcium sulphite. In case of *Mucor javanicus*, *plumbeus*, and *racemosus*, *Monilia candida*, and *Torula colliculosa* could demonstrate formation of acetaldehyde and glycerine in molecular proportion, according to formula $C_6H_{12}O_6 = CH_3.CHO + CO_2 + C_3H_8O_3$. In other fungi tested, spp. of Mucor, Aspergillus, etc., which have a more aerobic metabolism, this result not obtained. Either no glycerine is obtained, or a disproportionately large production of glycerine as in *Oidium lactis*. The wood-destroying fungi, *Aspergillus cellulosæ* and *Merulius lacrimans*, are able to produce acetaldehyde.—J. H. P.

4372. Brenztraubensäure als Zwischenprodukt der alkoholischen Zuckerspaltung. M. v. Grab (*Biochem. Zeit.*, 1921, **123,** 69-89).—Up till now, direct evidence in support of pyruvic acid as intermediate product rests mainly upon Fernbach and Schoen's experiments, to which certain objections can be raised based upon nature of fermentation organisms and condition of fermentation. Author now brings additional evidence

based upon a use of Dobner's synthesis, in which a molecule of pyruvic acid reacts with an aromatic amine and an aldehyde (or other molecule of pyruvic acid) to give a substituted cinchonin acid. Author therefore uses production of α-methyl-β-naphtho-cinchonin acid in the fermentation of sugar by expressed yeast juice in the presence of β-naphthylamin as evidence of the formation of pyruvic acid in the progress of fermentation. From 180 g. cane sugar, which was completely decomposed, the highest yield was 7·3 g. α-methyl-β-naphtho-cinchonin acid.—J. H. P.

4373. Über die Dismutation verschiedener Aldehyde durch Hefe. H. Kumagawa (*Biochem. Zeit.*, 1921, **123,** 225-30).—Experiments in fermentation of isovaleraldehyde, isobutylaldehyde, önanthol, and benzaldehyde by yeast in presence of an alkaline bicarbonate, which supply further evidence for the production of an alcohol and acid from the aldehyde by a type of Carnizzaro transformation.—J. H. P.

4374. Application de la méthode biochimique de Bourquelot à l'étude de quelques plantes de la famille des Caryophyllées et de celle des Papilionacées. C. Vergelot (*Bull. soc. chim. biol.*, 1921, **3,** 513-9).—All species examined contain sugar hydrolysable by invertase. In *Stellaria holostea* the reduction index agrees with that of sucrose. In other spp. unknown sugars other than sucrose are present. All spp. examined with the exception of *Stellaria holostea* contain substances hydrolysable by emulsin.—W. S.

4375. Action de l'émulsine des amandes sur le lactose en solution dans l'alcool éthylique à 85°. M. Bridel (*Bull. soc. chim. biol.*, 1921, **3,** 533).—By allowing emulsin to act on lactose in solution ethyl alcohol at 85°, a crystallisable product identified as β-ethylgalactoside has been obtained.—W. S.

4376. Application du procédé biochimique de caractérisation du glucose aux fruits de Viburnum opulus L., à l'extrait de quinquina rouge et à des extraits de cola. R. Arnold (*Bull. soc. chim. biol.*, 1921, **3,** 547-66).—In *Viburnum opulus* fruits glucose comprises about 50% of the reducing sugars. Similar values are given for extracts of quinquina and cola.—W. S.

4377. Fermentstudien. M. Jacoby (*Naturwiss.*, 1921, **9,** 588-92).—A summary of the author's researches.—W. S.

PERMEABILITY

4378. Ein Beitrag zur Giftwirkung der Schwermetallsalze auf das Pflanzenplasma —III. H. Kahho (*Biochem. Zeit.*, 1921, **122,** 39-42).—Same experimental methods employed (Abstract No. 3653, Vol. VI., p. 537), and finds that kation of heavy metals can be placed in following series with reference to their power of coagulating plant protoplasm: Hg>Cu>Zn>Pb>Fe,Co>Mn,Cd,Ni>Cu. A somewhat similar series obtained for toxicity as tested by subsequent capacity of cells to plasmolyse.—J. H. P.

4379. Ein Beitrag zur Permeabilität des Pflanzenplasmas für die Neutralsalze—IV. H. Kahho (*Biochem. Zeit.*, 1921, **123,** 284-303).—Experimental method. 1 to 1½ cm. of first root of germinating yellow lupin taken, piece placed in distilled water for 30 minutes, then contraction and subsequent expansion measured when roots placed in weakly hypertonic salt solution. Proportionate subsequent extension, as % original length, in fixed period (one hour) taken as measure of penetration of salts. In order of effect on permeability anions may be placed, Br,I,NO_3>Cl>tartrate>SO_4>citrate; kations, K>Na>Li>Mg>Ba,Ca. Of kations in this series, entrance of any one is hindered by presence of any other kation to right of it in series, and the further the kation lies to right in series the greater its retarding effect. Similarly, penetration of KCl hindered by presence of sulphate and citrate and accelerated by presence of Br,I or NO_3. The toxic action of pure solution of single neutral salts stands in strict relationship to their capacity for penetration, and external factors favouring penetration increase their toxicity. The more effective a salt is in precipitating colloids, possibly particularly lipoids, the less readily it is able to enter the plant protoplasm. As in plasm negatively charged colloids, such as lipoids, are the rule, the oppositely charged kations precipitate them, and the anions, on contrary, tend to retard precipitation. From this

standpoint it is easy to understand the great difficulty in penetration of bivalent kations, whilst in power of retarding precipitation the anions lie in series citrate $<SO_4 \cdots <I$, so that a kation exerts its most effective precipitating action, and therefore penetrates least when present as a citrate. Author applies these considerations to problems of antagonistic ion action. He also considers the effect of weak alkalis upon penetration of salts.—J. H. P.

GROWTH OF LOWER PLANTS

4380. Über die Bedeutung der Reihenfolge in der Biologie—I. L. Karczag (*Biochem. Zeit.*, 1921, **122,** 43-51).—Provided that the number of bacteria used is not too large, the author shows that the addition of chloroform or toluene first to a glucose bouillon and subsequent addition of *B. coli* has a greater inhibiting influence than the addition of *B. coli* to a glucose bouillon first, and then addition of the antiseptic. In both cases there is inhibition compared with the control.—H. K.

4381. Die Bedeutung der Hämoglobin-Aminosäuren für die Züchtung der Influenzabacillen. M. Jacoby and K. Frankenthal (*Biochem. Zeit.*, 1921, **122,** 100-4).—The influenza bacillus grows on agar if histidine be added. A less favourable growth is obtained on addition of leucine.—H. K.

4382. Über die Einwirkung von Silberverbindungen auf Hefe. E. Zerner and R. Hamburger (*Biochem. Zeit.*, 1921, **122,** 315-8).—Silver nitrate, chloride, and carbonate have a toxic action on yeast.—H. K.

4383. La notion du "bios." P. Biourge (*Compt. rend. soc. biol.*, 1921, **85,** 254-6).—A criticism of Wildier's work on the need of "bios" for development of yeast cells.—W. S.

4384. The Bactericidal Action of the Quinones and Allied Compounds. G. T. Morgan and E. A. Cooper (*Biochem. J.*, 1921, **15,** 587-94).—Benzoquinone possesses a very high bactericidal power, about 80 to 190 times that of quinol and phenol. The bactericidal power of the quinones decreases as the homologous series is ascended; the reverse is the case with phenols, alcohols, and amines. Aliphatic ketones (acetone, diacetyl, and acetylacetone) are much less efficient bactericides than benzoquinone, phenol, or formaldehyde.—W. S.

4385. Longevity of Spores of a Fungus in a Museum Specimen. R. L. Collett (*Trans. Brit. Mycol. Soc.*, 1920, **7,** 217-8).—Records a case of the persistence of life in the spores or mycelium of a hyphomycete (=*Cladosporium fumago*, Lk.) kept as a museum specimen for 67 years.—C. W.

4386. Upon the Ocellus Function of the Subsporangial Swelling of Pilobolus. A. H. R. Buller (*Proc. Linn. Soc.* (Lond.), 1921, 63).—The subsporangial swelling of *Pilobolus* functions, not merely as part of a squirting apparatus, but also as an ocellus, which receives the heliotropic stimulus, which causes the stipe to turn towards the light. The sporangiophore of *Pilobolus* appears to be the only orthoheliotropic plant organ known which takes up its positively heliotropic position owing to the possession of a special light-perceiving cell structure.—C. W.

4387. The Comparative Influence of Pure and Commercial Sugars and of Combined and Separate Sterilisation on Bacterial Metabolism. C. G. L. Wolf (*Brit. J. Exp. Path.*, 1921, **2,** 266-75).—Four organisms—*B. coli*, *B. welchii*, *B. murisepticus*, and *B. tetani*—have been examined to ascertain whether the purity of a sugar or the combined sterilisation of the sugar with the bouillon had an effect on the products of bacterial metabolism. The sugars used were glucose and lactose. While minor differences were encountered, these were not sufficient to indicate that combined sterilisation or commercial glucose or lactose would influence a fermentation reaction sufficiently to lead to error. At the same time it must be remarked that with organisms more sensitive than those employed in the present study it is quite possible that such errors could take place. — *Author's Abstract.*

ASSIMILATION

4388. Das elektrolytische Leitvermögen verdünnter Lösungen unter dem Einfluss submerser Gewächse. F. Ruttner (*Anz. d. Akad. d. Wiss. Wien., Math.-nat. Kl.*, 1921, 77-9).— In solutions containing calcium bicarbonate and *Elodea* and other water plants, a very rapid decrease in electrical conductivity takes place in the light owing to assimilation of CO_2 and consequent precipitation of $CaCO_3$. Later the conductivity increases in intensive illumination and falls in the dark. This phenomenon is correlated with the presence of the $CaCO_3$. Ca-ions are absorbed more slowly than CO_3-ions, with the result that OH-ions increase in the solution and the conductivity consequently increases.—W. S. (*Ber. ü. d. ges. Physiol.*).

FLOWER AND FRUIT FORMATION

4389. Su la partenocarpia. B. Longo (*Riv. di biol.*, 1920, **2,** 597-609).—Records and describes parthenocarpy in the apple.—W. S. (*Ber. ü. d. ges. Physiol.*).

4390. Flowering and Fruiting of Plants as Controlled by the Length of Day. W. W. Garner and H. A. Allard (*Yearbook U.S. Dept. Agric.*, 1920, 377-400).—The authors state that within suitable limits of temperature and other important factors in plant growth there would seem to be no reason why almost any plants may not be made to flower and fruit at any season of the year and in any region. By shortening the daily light period through the use of dark chambers or lengthening it by means of artificial light, reproductive activities may be induced almost at will. With proper knowledge of the specific requirements of each plant, therefore, the florist should be able to force flowering at any desired time of the year (see also Abstract No. 3685, Vol. VI., p. 542). —C. W.

ENVIRONMENTAL FACTORS

4391. Salt Water and Plants at Kew. Anon. (*Gard. Chron.*, 1921, **70,** 295-6).— Owing to the prolonged drought of 1921 the large lake at Kew, which receives its water-supply from the Thames, partially dried up, and the salt concentration of the water was considerably increased, with the result that many plants which were supplied with water from this source suffered severely, undergoing wholesale browning of the edges of the leaves.—C. W.

4392. Injury to Apples. W. Tayler (*Gard. Chron.*, 1921, **70,** 326).—Suggests that the unusual drought of 1921 was the cause of the markings which were very apparent round the eye and stalk ends of certain varieties of apples (see Abstract No. 4091, Vol. VI., p. 606).—C. W.

4393. The Pollination of the Primrose. A. A. Dallman (*J. Bot.*, 1921, **59,** 337-45). —Gives a list of the chief insect visitors which regularly visit the flowers of the primrose when the climatic conditions are favourable. The flowers show considerable adaptation to zoophily.—C. W.

4394. A Spotting of Citrus Fruits due to the Action of Oil liberated from the Rind. H. S. Fawcett (*Bull. Univ. California Agric. Exp. Stat.*, 1916, **266,** 261-9).—The effect of a given amount of oil from the rind was greater on fruit in a moist atmosphere than on similar fruit in a dry atmosphere; the moisture being the same, the effect was greater on green or immature fruit than on fully coloured or mature fruit. The action of the oil on the surface of the rind is extremely rapid.—C. W.

4395. Forest Formations and Successions of the Sat Tal Valley, Kumaun Himalayas. L. A. Kenoyer (*J. Indian Bot.*, 1921, **2,** 236-58).—In the region between 4,000 and 5,000 feet in altitude in the part of Kumaun studied, three distinct forest types are found—viz., the *Bauhinia* spp., the *Pinus longifolia*, and the *Quercus incana*. The *Bauhinia* is a distinctly monsoon type, and is adapted to great extremes of humidity. The pine forest is adapted to relatively low humidity and high insolation, whereas

the oak forest is of the broad-leaved sclerophyllous type, and is adapted to places with no very great extremes of temperature and humidity.—C. W.

4396. The Growth Forms of Some Plant Formations of Southern Norway. M. Vahl (*Biol. Medd. d. K. Danske Videnskabernes Selskab*, 1919, **13,** 1-45).—An ecological study of the district of Kragerö in Norway.—C. W.

BOOK REVIEW

The Autonomic Nervous System. Part I. By J. N. Langley. Pp. 80. Cambridge: W. Heffer and Sons, Ltd.

A closely written account of that complex and widely distributed efferent portion of the nervous system to the unravelling of whose intricacies the researches of the author have so eminently contributed. The argument for the name "autonomic" is given in the opening chapter, the autonomic system being there defined as "the nerve cells and nerve fibres, by means of which efferent impulses pass to tissues other than multinuclear striated muscle." The author's convenient term "parasympathetic" (1905) for the tectal, bulbar, and sacral outflows of small efferents is, of course, not to be confused with the term "paraganglia of the sympathetic" introduced abroad later for collections of chromaffin cells, such as adrenal medulla. The text, although compact, does not obtain its brevity at the expense of stating the ambiguities and discrepancies of many of the existent experimental data. The specific action of drugs on different parts of the system is discussed, and the author's "receptive" cell substance theory in regard to it is given. A later phylogenesis of the sympathetic as contrasted with the parasympathetic found, it is urged, the elements of the epidermis modified from those obtaining at time of origin of the parasympathetic, and suited to the sympathetic and for the most part (save sweat-gland cells) to sympathomimetic drugs. Points discussed are (1) whether in the doubly (parasympathetic and sympathetic) innervated tissues the actions of both nerve supplies fall, in fact, on one and the same cell of the tissue, or separately on two separate cell types in the one common tissue. It is shown that if the latter, then the two types must be intimately intermixed. (2) Whether the selective susceptibility to specific drugs is an "inherited character" of the peripheral cell, or is produced in each generation in result of the play of nerve influence upon the cell: the data available incline toward the former alternative. Attention is drawn to the variety of degree of the autonomic innervation of various tissues and of various examples of one and the same class of tissue—*e.g.*, the potent innervation of the salivary gland cell, and the minimal or doubtfully existent innervation of the intestinal gland cell. The evidence of direct innervation of the cutaneous melanophores is dealt with; it could be strengthened by reference to Redfield's work (*J. Expt. Zool.*, 1918, **26,** 275). Direct constrictive influence of efferent nerve fibres on blood-capillaries is concluded to be at present unproven. Finally, the volume's instalment summarises the question of dependence of the so-called "tone" of striated muscle upon centrifugal impulses via sympathetic. "That the tone of the muscles is entirely due to impulses passing by the sympathetic is not tenable." "A defect in the evidence that the sympathetic causes tonic contraction in muscle is that no one has been able to obtain contraction by stimulating it." Severance of the sympathetic nerves supplying a muscle may cause a slight impairment of tone, but this may be the result of section of vaso-motor nerves to the muscle. The whole book is an authoritative exposition by a first-hand master of its subject.—C. S. S.

H. K. LEWIS & CO. LTD., 28, GOWER PLACE, LONDON, W.C. 1

PHYSIOLOGICAL ABSTRACTS

INDEX OF AUTHORS

Aaron, A. H., and others: Liver Function Test, 632
Abderhalden, E.: Abderhalden Reaction, 450; Blood Amino-Acids, 311; Blood Sedimentation, 423; Chyme Amino-Acids, 317; Foreign State, 107; Gaseous Exchange in Beri-Beri, 140; Polysaccharide Defence Enzymes, 352; Sedimentation of Corpuscles, 78; Vitamins and Basal Metabolism, 633; Vitamins, 263, 577; Review, 545
Abderhalden, E., and Brammertz, W.: Optones and Gas Exchange, 149.
Abderhalden, E., and Fodor, A.: Adsorption by Charcoal, 11; Yeast Peptases, 96
Abderhalden, E., and Gellhorn, E.: Optones, 213
Abderhalden, E., and Handovsky, H.: Ferments and Structure, 409
Abderhalden, E., and Kürten, H.: Amino-Acids and Red Cells, 423; Polypeptides and Enzymes, 409
Abderhalden, E., and Schmidt, L.: Gas Exchange in Beri-Beri, 140
Abderhalden, E., and Wertheimer, E.: Vitamins, 577, 633
Abe, K.: Cocaine on Bloodvessels, 218; Pulmonary Circulation and Histamine, 194
Abelin, J.: Iodine Compounds and Growth, 519
Abelin, J. See Uhlmann, F.
Abelin, J. See Wegelin, C.
Abelous, J. E., and Aloy, J.: Oxidation and Hydrolysis, 352
Abelous, J. E., and Soula, L. C.: Blood Cholesterol, 316
Abrami, P.: See Widal, F.
Acél, D.: Micro-N Method, 470
Achard, C., and Feuillié, E.: Albumoses of Blood, etc., 311
Achard, C., and others: Adrenaline Diabetes, 379
Ackermann, D.: Curari Substitutes, 3; Arthropod Extractives, 479; Mytilitol, 549; Mytilus Extractives, 614
Ackermann, D., and Kutscher, F.: Methylated Amino-Acids, 86
Acton, H. W.: Quinine on Uterus, 81
Acton, H. W., and King, H.: Quinine in Blood, 279
Adair, G. S.: Diffusion, 7; Blood CO_2 and Hill's Equation, 315
Adair, G. S., and others: Human Hæmoglobin, 565
Adair, G. S.: See Stiles, W.
Adam, A.: Lactacidogen, 484
Adam, N. K.: Microrespirometer, 5; Oxygen Use of Muscle, 432
Adams, D. K., and Morris, N.: Anoxæmia, 136
Addis, T. and Drury, D. R.: Urea of Blood and Urine, 62
Adelsberger, L.: Leucocytosis in Infants, 434
Adie, W. J.: See Cole, S. W.
Adler, E.: Occult Blood, 190; Lactacidogen, 484
Adler, E.: See Isaac, S.
Adler, L.: Bloodvessel Pharmacology, 592; Heat Regulation and Hormones, 69; Pancreas Functions, 582
Adolph, E. F.: Water Regulation, 141; Water of Body, 320
Adolph, E. F., and Ferry, R. M.: Hb Dissociation Curves, 406
Adrian, E. D.: Recovery Process, 413
Adrian, E. D., and Owen, D. R.: Muscle Response, 557
Adriano, T.: Lactose Estimation, 171
Aggazzotti, A.: Sound Perception, 420
Ahlgren, G.: Muscle and Methylene Blue, 414
Aihara, H.: Artery Structure, 482
Airila, V.: See Michaelis, L.
Aitkin, R. D.: Tree, Water Relations, 604
Albertoni, P.: Vasomotor Function, 133
Alday-Redonnet, T.: Adrenalin Sensibilisation, 71
Alexander: Scopolamine Poisoning, 333
Alexander, B.: Caffeine Anæsthesia, 278
Alexander-Katz, R.: See Frank, E.
Alexandre, R., and Moulinier, R.: Pulse Curves, 629
Aliquo, F.: Phenolipoids, 279
Allard, H. A.: See Garner, W. W.
Allen, B.: See Sherman, H. C.
Allen, F. M.: Diabetes, 51; Experimental Diabetes, 269
Allen, F. M., and Wishart, M. B.: Diabetes, 142
Allen, H. J., and Benedict, S. R.: Creatinæmia, 178
Allen, W. R.: Biology of Mussels, 114
Allesch, G. J. v.: Chimpanzee Infancy, 547
Almeida, A. O. de: Respiration of Brain, 503
Almeida, M. O. de: Basal Metabolism, 438; Frog Reflexes, 417; Heat Polypnœa, 430; Muscular Work, 415; Œdema, 430; Plantar Reflex, 417
Aloy, J.: See Abelous, J. E.
Alsberg, C. L.: See Woodward, H. E.
Alter, N. M.: See Macy, I. G.
Alu, A. F.: See Underhill, F. P.
Alverdes, F.: Radium and Spermatozoa, 76
Alvis, B. Y.: See Sachs, E.
Alway, F. J.: See Rost, C. O.
Amantea, G.: Experimental Epilepsy, 361
Amantea, G., and Krzyszowsky, C.: Hb Crystals, 406
Ambard, L.: Arrest of Glycolysis, 52; Amylase, 240; Sugar Estimation, 6; Urea Estimation, 5
Ambard, L., and Lux, H.: Diabetes, 323
Amberg, S., and Maver, M. E.: Citric Acid of Urine, 209
Amberger, C., and Bromig, K.: Goose Fat, 550
Amberger, K.: See Wirthle, F.
Amsler, C.: Heart Records, 4; Inverted Adrenaline Action, 147; Pain Reflexes, 493
Anderodias, See Dubreuil, G.
Anders, H. E.: Embryological Studies, 304
Andersen, E.: See Thannhauser, J. S.

Andersen, E. N., and Walker, E. R.: Alga Ecology, 542
Anderson, E. V., and others: Milk and Scurvy, 578
Anderson, R. J., and Kulp, W. L.: Acerin, 285; Maple Globulins, 531
André-Thomas: Pilomotor Reflex, 248
Angelico, F.: Salicylic Acid in Body, 439
Anon.: Agriculture Research, 530; Drought at Kew, 649; Endocrine Organs, 581; History of Anaphylaxis, 108; Injury to Apples, 606; Oat Growth, 340; Plum Trees, 342; Potatoes, 464
Anrep, G. V.: Salivary Gland Metabolism, 197
Anrep, G. V., and Daly, I. de B.: Pancreas Currents, 317
Anrep, G. V., and Drummond, J. C.: Vitamin and Secretin, 202
Anthony, R., and Champny, C.: Pangolin Spermatozoa, 275
Anthony, S., and Harlan, H. V.: Barley Pollen, 538
Anthony, S.: See Harlan, H. V.
Aoyama, S.: See Murayama, Y.
Apajalahti, A., and Panelius, A.: Fatigue, 492
Apitz, G., and Kochmann, M.: Hæmolysis, 33
Arai, M.: Amino-acids and Pancreas, 506; Leucin and Bacteria, 645
Archer, E.: Life of Cut Flowers, 346
Arey, L. B.: Glochidia, 293
Arinstein, B.: See Neuberg, C.
Arloing, F., and others: Anaphylaxis and Agglutination, 335
Armsby, H. P., and others: CO_2 Heat-Ratio, 68
Armstrong, H. E.: Enzyme Action, 407
Arndt, H.: Specific Gravity of Blood, 252
Arnold, R.: Fruit Sugars, 647
Arnold, R.: See Bridel, M.
Arnold, H. R.: See Whipple, G. H.
Arntzenius, A. K. W.: See Stheeman, A. H.
Aron, H., and Gralka, R.: Vitamins, 201; Sex Characters, 449
Aron, M.: Testis Interstitial Cells, 384
Aron, M.: See Simon, R.
Arreguine, V.: Fruit Sugar, 336
Arric, M. Le Fèvre de: $BaCl_2$ on Heart, 313; Phagocytosis, 480
Arrillaga, F., and Guglielmetti, J.: Emetine on Heart, 454
Arrillaga, F., and others: Quinidine on Heart, 524, 525
Arrillaga, F. C., and Waldorp, C. P.: Quinidine for Fibrillation, 389
Arthus, M.: Anaphylaxis and Immunity, 91; Experimentation, 469
Artschwager, E., and Smiley, E. M., Review, 347
Asami, G.: Aberrant Bone Formation, 357
Asami, G., and Dock, W.: Bone Formation, 21
Aschenheim, E., and Meyer, S.: Effect of Light, 625
Ascoli, M., and Fagiuoli, A.: X Rays and Pituitary, 74
Ashby, W.: Blood Destruction, 425
Asher, L., and Doubler, F. H.: Spleen Extirpation, 503
Asher, L., and Horrisberger, W.: Phloridzin, 519
Asher, L., and Koda, C.: Spleen Extirpation, 503
Asher, L., and Matsuno, G.: Thymus, Spleen, etc., 639
Asher, L., and Nyffenegger, W.: Thyroid and Thymus, 520
Asher, L., and Spiro, K.: Review, 106, 466
Aszódi, Z.: Hibernation, 206
Atanasoff, D., and Johnson, A. B.: Cereal Disinfection, 544
Atchley, D. W.: See Palmer, W. W
Athias, M.: Hormones and Uterus, 327
Athmer, F.: See Schüller, J.
Atkins, W. R. G.: See Jameson, A. P.
Atkinson, A., and Nelson, J. B.: Sunflowers, 395
Atkinson, H. V.: NaCl Estimation, 5; Blood in Meat Feeding, 368
Atkinson, H. V.: See McGuigan, H.
Atkinson, M., and others: Kidney Secretion, 444
Atwell, W. J.: Pineal and Tadpole Pigment, 213
Atzler, E., and Döhring, E.: Blood Coagulation, 37
Atzler, E., and Lehmann, G.: H-ion on Vessels, 501
Aub, J. C., and Means, J. H.: Basal Metabolism and Liver, 438
Aub, J. C., and others: Metabolism after Adrenalectomy, 212; Traumatic Shock, 87
Aubel, E.: Culture Media, 288; Glycerol Oxidation, 459
Aubel, E.: See Blum, L.
Audige, P.: Growth and Temperature, 65
Audova, A.: See Lipschütz, A.
Auer, J.: See Meltzer, S. J.
Austin, J. H., and others: Urea Excretion Rate, 208
Austin, J. H., and Van Slyke, D. D.: Plasma Chloride, 109
Autenrieth, W., and Quantmeyer, H.: Uric Acid Estimation, 425
Avery, O. T.: See Thjotta, T.
Ayer, J. B., and Foster, H. E.: Protein in C.S. Fluid, 420
Ayers, H.: Spinal Nerves of Amphiosus, 247
Azzi, A.: Fatigue, 487; Frog Metabolism, 438; Skin and Expired Air, 372; Ultra-Violet on Phagocytosis, 480

Baas-Becking, G. M. L.: Latency of Enzymes, 297
Bach, A., and Sbarsky: Serum after Toxins, 89
Bach, E.: See Rona, P.
Bacharach, A. L.: See Jephcott, H.
Bachem, C., and Kriens, H.: Iodoform Substitutes, 407
Bachholtz, J.: See Bock, J.
Bachman, E.: See Clowes, G. H. A.
Bachrach, E.: Action of Saliva Ash, 113
Bachrach, E.: See Richet, C.
Backmann, E. L.: Tissue Extracts, 455
Bagby, E.: See Stratton, G. M.
Bagg, H. J.: See Gudernatsch, J. F.
Baggio, G.: Spleen and Thyroid, 520; Spleen and Thymus, 639; Thyroid and Blood-Picture, 326
Bahlmann, R.: Reaction of Blood and Urine, 145
Bailey, C. H.: See Collatz, F. A.
Bailey, C. V.: Basal Metabolism Apparatus, 403, 470
Bailey, H.: Oöphorectomy, 450
Bainbridge, F. A.: Obituary, 546
Bainbridge, F. A., and Underhill, S. W. F.: Pulmonary Circulation, 315
Baitsell, G. A.: Embryo Connective Tissue, 20; Blood Plasma for Imbedding, 294
Baker, J. L., and Hulton, H. F. E.: Sugar Estimation, 6
Baker, M. L.: See Benedict, F. G.
Baker, R. T.: Crystals in Wood, 644
Balasubramanyam, M.: Plant Variegation, 102
Balderston, L.: Tannins, 338
Baldwin, F. M.: Muscle Fatigue and Lipoids, 180; Muscle Fatigue, 246
Baldwin, L. B.: See Mackenzie, G. M.
Baldwin, W. M.: Syringomyelocele, 641; Ultra-Violet on Tadpoles, 293
Ball, N. G.: See Dixon, H. H.

Baly, E. C. C., and Heilbron, I. M.: Carbohydrate Formation, 603
Banu, G., and Bourguignon, G.: Chronaxie, 359
Banu, G., and others: Chronaxie, 558; Chronaxie in New-Born, 304
Banu, G.: See Bourguignon, G.
Banu, G.: See Dorlencourt, H.
Barach, A. L., and Woodwell, M. N.: Oxygen Therapy, 588
Barbé, A.: Choroid Plexus, 185; Choroid Plexus Permeability, 32
Barber, W. H., and others: Gastric Resection, 505
Barbour, H. G.: Heat Regulation, 268; Temperature and Blood Concentration, 321
Barbour, H. G., and Baretz, L. H.: Temperature after Gum Infusion, 89
Barbour, H. G., and Freedman, B. P.: Pilocarpine in Infections, 52; Pilocarpine and Saliva, 573
Barbour, H. G., and Herrmann, J. B.: Antipyretics, 589
Barbour, H. G., and Hjort, A. M.: Cl Antiseptics, 594
Barbour, H. G., and Rapoport, F. H.: Adrenaline Action, 148
Barbour, H. G., and Tolstoi, E.: Heat Regulation, 321
Bard, L.: Orientation, 360
Bardier, E., and others: Adrenaline and Caffeine, 379
Bardier, E., and Stillmunkés, A.: Adrenaline Action, 274
Barcroft, J.: Anoxæmia, 1; Alpinism, 315
Barcroft, J., and Nagahashi, M.: Blood Oxygen Pressure, 572
Barcroft J., and others: Circulation Rate, 572
Barcroft, J.: See Adair, G. S.
Barendrecht, H. P.: Phosphatase-Phosphatese, 353 Urease and Urea Synthesis, 352
Barenne, J. G. D. de: Coronary Circulation, 370, 428
Baretz, L. H.: See Barbour, H. G.
Barkan, G., and others: Buffered Perfusion Fluids, 637
Barkan, G.: See Hahn, A.
Barnett, C. W.: See Barnett, G. D.
Barnett, G. D., and Barnett, C. W.: Comparator, 108
Barr, D. P., and Peters, J. P.: Cardiac Dyspnœa, 48
Barr, D. P.: See McCann, W. S.
Barr, D. P.: See Peters, J. P.
Barratt, J. O. W.: Brownian Movement, 293; Fibrinogen and NaOH, 254
Barré, F. A.: See Duverger, C.
Barré, J. A., and Schrapf, R.: Cerebro-Spinal Pressure, 365
Barrenscheen, H.: See Fischer, H.
Barringer, T. B.: Curative Exercises, 370
Barrington, F. J. F.: Micturition, 361
Barry, D. T.: Myocardial Conduction, 569; Nicotine on Heart, 132, 313
Barthélémy, H.: See Terroine, E. F.
Bartholomew, R. A., and others: Pregnancy Diagnosis, 215
Bartholomew, R. A., and others: Pregnancy Diagnosis, 215
Basch, E.: See Meyer-Bisch, R.
Baskervill, M. L.: See Lillie, R. S.
Basler, A.: Capillary Circulation, 502
Bass, E., and Trendelenburg, W.: Muscle Action Currents, 618
Bassett-Smith, P. W.: Scurvy, 436
Bast, T. H.: Amitosis in Bone, 413
Battelli, F., and Stern, L.: Oxidising Enzymes, 535; Oxygen Pressure and Respiration, 48
Battle: See Salant, W.
Battez, G., and Dubois, C.: Urea in Breath, 49
Bau, A.: Oxalic Acid Estimation, 172; Oxalic Acid in Plants, 599; Yeastless Fermentation, 646
Bauer, E.: Purine in Cells, 553
Bauer, F. C.: Rock Phosphates, 606
Baule, B.: Plant Growth, 99
Bauman, L.: Urobilin, 597
Baumann, E. J.: See Marine, D.
Baumann, M.: Effect of Light on Leucocytes, 625
Baumberger, J. P.: Shaker, 4
Baumberger, J. P., and others: Effect of Tobacco, 623
Baumgardt, G., and Steuber, M.: Fat from Carbohydrate, 66; Metabolism in Boys, 68
Baumgärtel, O.: Cyanophyceæ, 228
Baumier, P.: See Lenoble, E.
Baur, E., and Herzfeld, E.: Yeastless Fermentation, 297
Bayer, G.: See Pfeiffer, H.
Bayeux, R.: Oxygen in Alpinism, 315; Oxygen Injections, 49; Oxygen Injections for Mountaineers, 631; Reductases, 243
Bayliss, W. M.: Acidosis, 135
Bayliss, W. M.: Review, 168
Bazett, H. C., and Haldane, J. B. S.: Hot Baths, 324
Bazett, H. C.: See Dreyer, G.
Bechhold, H.: Hæmolysis, 34
Becher, E.: Indican in Kidney Disease, 270; Residual Nitrogen, 221; Tissue Indican, 63; Urea of Tissues, 62
Bechhold, H., and Reiner, L.: Stalagmones, 210
Becht, F. B.: Cardio-Inhibitory Centre, 369
Becht, F. C.: Cerebro-Spinal Fluid, 185
Becht, F. C., and Gunner, H.: Cerebro-Spinal Fluid, 365
Beck, E. C.: See Aaron, A. H.
Beck, F.: See Herzog, R. O.
Beck, K. F.: See Wacker, L.
Becker, F.: See Seitz, A.
Becker, J.: Skin of Infants, 486
Becker, K.: See Herzog, R. O.
Beckmann, E., and Liesche, O.: Lignin, 644
Beckwith, C. S.: Fertilisers, 340
Beckwith, C. S.: See Lipman, J. G.
Beeler, C.: See Wilder, R. M.
Behan, R. J.: $Ca_3(PO_4)_2$ and Bone Growth, 245
Behr, H.: See Borsche, W.
Behram, J. D. E.: See Fowler, G. J.
Behre, E. H.: See Riddle, O.
Bell, R. D., and others: Chloride Estimation, 109
Bell, R. D.: See Doisy, E. A.
Bellido, J. M.: See Suñer, A. P.
Bellis, B.: See Supplee, G. C.
Beltrami: Cattle Feed, 58
Benda, C.: Testis Interstitial Cells, 329
Benedict, C. G., and Benedict, F. G.: Extra Foods, 262
Benedict, F. G.: Basal Metabolism, 437
Benedict, F. G., and Hendry, M. F.: Metabolism of Girls, 266
Benedict, F. G., and others: Animal Temperatures, 440
Benedict, F. G., and Talbot, F. B.: Metabolism of Children, 511
Benedict, F. G.: See Benedict, C. G.
Benedict, F. G.: See Harris, J. A.
Benedict, S. R.: Sugar in Urine, 6
Benedict, S. R., and Osterberg, E.: Urine Sugar, 549
Benedict, S. R.: See Allen, H. J.
Benedict, S. R.: See Davis, A. R.

Benedict, S. R.: See Nash, T. P.
Benedict, S. R.: See Theis, R. C.
Bennett, T. I., and Dodds, E. C.: Digestion and Alveolar Air, 195
Bennett, T. I.: See Dodds, E. C.
Benoit, J.: Epididymis and Vas, 328; Epididymis Nuclei, 640
Berblinger, W.: Pituitary, 447; Pituitary and Thyroid, 640
Bercovitch, A.: Sterility, 383
Bercovitz, Z., and Rogers, F. T.: Stomach Motility 260; Turtle Stomach Movements, 198
Bercovitz, Z.: See Rogers, F. T.
Berg, H. J. v. d.: Endocrine Epilepsy, 448
Berg, W.: Starving Liver Structure, 55
Bergansius, F. L.: Size of Corpuscles, 494; Red Cell Measurement, 565
Bergeim, O.: See Hawk, P. B.
Bergel, S.: Lymphocytes, 19
Berger, W.: See Doerr, R.
Bergh, H. v. d., and Muller, P.: Lipochrome, 189
Bergmark, G.: Sensation Paths, 560
Bergstrand, H.: Bacteria, 229; Parathyroids, 272
Berkeley, C.: Anærobiosis, 299; Pentose Mononucleotide, 11
Berliner, M.: Body Weight, 141
Bernbeck, O.: Plants in Wind, 167, 233
Berridge, E. M.: See Paine, S. G.
Berthelot, A., and Ossart, Mlle.: Tyrosine, 351
Bertrand, G., and Compton, A.: Salicinase, 535
Bertrand, G., and Vladesco, R.: Zn in Tissues, 235, 349
Bétancès, L. M.: Azurophile Granules, 554; Eosinophile Cells, 301; Intra-Vitam Staining, 300
Beuchelt, H.: Photo-electric Currents, 307
Beumer, H.: Adrenaline and Glucose, 274; Fat as Antigen, 529; Suprarenal and Diabetes, 443
Bews, J. W.: Ecology of Natal, 343
Beyerholm, O.: See Lundsgaard, C.
Bezssonoff, M.: Antiscorbutic of Potato, 61; Antiscorbutics, 436
Bezssonof, N.: Sucrose and Fungi, 162; Vitamin Colour Test, 511
Bhate, S. N.: See Fowler, G. J.
Bhide, R. K.: Drought Plants, 343
Bibb, L. B.: Sensitive Briar, 604
Biberfeld, J.: Codein Derivatives, 85; Drug Tolerance, 588
Bickel, A., and Eweyk, C. v.: Heat Secretion, 317
Bickel, H.: Nerve Impulse, 23
Bidault: Vitamins and Food Preservation, 263
Biedermann, W.: Autolysis of Starch, 224; Diastase Coferment, 13; Diastases, 297; Diastase and Starch, 408
Biedl, A.: Internal Secretions, 582
Bierens de Haan, J. A., and Przibram, H.: Body Temperature, 142
Bierry, H., and others: Sugar in Cancer, 380
Bierry, H., and Rathery, F.: Diabetes, 50; Blood-Sugar and Liver, 322
Bierry, H.: See Desgrez, A.
Biffi, P.: Blood Urate, 549
Billigheimer, E.: Pilocarpin-Adrenalin Antagonism, 82; Sweat Innervation, 210
Bilski, F.: Adrenaline and Growth, 583; Tadpole Growth, 376
Biltz, H., and Herrmann, L.: Uric Acid, 407
Binet, L., and Brocq, P.: Pancreatitis, 56
Binet, L.: See Achard, C.
Binet, L.: See Roger, H.
Bing, R.: Ions on Oxidation, 204
Binger, C. A. L.: See Van Slyke, D. D.
Biourge, P.: "Bios," 376, 648
Bird, H. S.: See Ramsay, H. J.
Bishop, L. F.: Atropin for Heart Irregularities, 369
Bissell, F. S.: See McClendon, J. F.
Bittorf, A.: Pigment in Addison's Disease, 457
Bjarnason, S. A.: See Cruess, W. V.
Bjure, A., and Svensson, J.: Adrenaline Injections, 583
Blackham, R. J.: Dried Milk as Food, 277
Blackman, F. F.: Plant Carbohydrates, 286
Blackman, V. H.: Geotropic Response, 290; Root Pressure, 461
Blair, A. W., and Brown, B. E.: Borax in Manures, 602
Blair, A. W.: See Lipman, J. G.
Blakeslee, A. F.: Datura Disease, 291
Blankenhorn, M. A.: Automatic Blood-Pressure Record, 370
Blankenhorn, M. A., and Warnick, E. J.: Manometer Float, 470
Blanton, H. W.: See Blanton, W. B.
Blanton, S.: Speech Disorders, 456
Blanton, W. B., and Blanton, H. W.: Vagal Syncope, 258
Blaringhem, L.: Flower Colour and Sex, 102
Blatz, W. E.: See Hartman, F. A.
Blau, N. F.: Creatinine Estimation, 550
Blau, N. F., and Nicholson, S. T.: Fats in Diabetes, 51
Blish, M. J.: Frozen Wheat, 463
Bloch, C. E.: Xerophthalmia, 60; Infant Feeding Diseases, 139
Bloch, E.: See Rona, P.
Bloch, S.: See Laubry, C.
Bloom, G. H.: See Reimann, S. P.
Bloom, W.: See Macht, D. I.
Bloor, W. R.: Lipoid Balance, 189; P_2O_5 in Blood, 610
Bloor, W. R., and Farrington, E. D.: Lipæmic Blood, 38
Bloor, W. R.: See McKellips, G. M.
Bloor, W. R.: See Sundstroem, E. S.
Blühdorn, K.: Calcium and P. Metabolism, 636
Bluhm, A.: Sex Determination, 522
Blum, F., and Strauss, E.: Iodine Proteins, 10
Blum, G.: See Ursprung, A.
Blum, L.: Diuretics, 593
Blum, L., and Aubel, E.: Valerianic Acid, 439
Blum, L., and others: Ca Diuresis, 637; Na and K of Tissues, 425
Blum, W.: Amino-Acids of Urine, 67
Blunt, K., and Dye, M.: Women's Metabolism, 376
Boas, F.: Aspergillus Physiology, 161, 162
Boas, I.: Occult Blood, 497
Boas-Weihenstephan: Starch Digestion by Fungus, 225
Boccadoro, C.: Blood Pictures, 495
Bock, A. V.: Plasma Volume, 128
Bock, A. V.: See Adair, G. S.
Bock, A. V.: See Fitz, R.
Bock, A. V.: See Means, J. H.
Bock, J., and Bachholtz, J.: Caffeine on Heart Output, 81
Bock, J., and Iversen, P.: Phosphates of Urine, 144
Bodansky, M.: Zinc and Cu in Brain, 620; Zinc in Tissues, 548
Boden, E., and Neukirch, B.: Quinidine on Heart, 429
Bodine, J. H.: Catalase, 410; Reaction of Protozoan Cultures, 410
Boeck, W. C.: Protozoa Death Temperatures, 551
Boeke, J.: Muscle Innervation, 357

Boeminghaus, E.: Fat Staining Methods, 617
Boenheim, F.: Chloride Metabolism, 513
Boer, S. de: Alternation of Heart, 628; Barium on Heart, 192; Extra-Pause, 499; Fibrillation, 191, 192, 369; Fibrillation of Ventricle, 43; Heart Rhythm, 499; Muscle Innervation, 486; Osmotic Dehydration, 2; Pause of Ventricle, 43; Rhythm of Heart, 44; Ventricular Fibrillation, 257
Boersma, J.: Kefir Granules, 396
Bogendörfer, L.: Body Water, 320
Bogert, F. v. d.: Bromide in Milk, 527
Bohn, G.: See Drzewina, A.
Bohnenberger, F.: Digitalis and Colour-Sense, 27
Bohrmann, A.: See Tillmans, J.
Bohring, E. G., and Titchener, E. B.: Wrightson's Theory, 27
Boiget: See Dausset, H.
Bok, S. T.: Neuron Staining, 237
Bokorny, T.: Enzymes, 352; Plant Nutrition, 164; Yeast and Enzymes, 225
Bolk, L.: Evolution and Endocrines, 445
Bollman, J. L.: See Welker, W. H.
Bolte, E.: Swarm Cell Motility, 231
Bolten, G. C.: Fragilitas Ossium, 283
Bolton, C.: Absorption from Peritoneal Cavity, 630
Bonar, B. E.: See Grulee, C. G.
Bonar, B. E.: See Phemister, D. B.
Bond, C. J.: Auto-Hæmagglutination, 34
Bondorff, K. A.: Soil Acidity, 167
Bonneamour, S.: See Pic, A.
Bönninger, M.: Corpuscle Sugar and Cl, 580
Bonsmann, M. R.: Congo Red and Colloids, 496
Boock, E.: See Trevan, J. W.
Böös, G.: Plant Parthenogenesis, 232
Boothby, W. M.: Adenoma of Thyroid, 147; Basal Metabolism in Disease, 65; Hyperthyroidism, 446; Parathyroids, 446
Boothby, W. M., and Sandiford, I.: Adrenalin and Glucose, 207; Air, 169; Review, 104
Boothby, W. M., and Sandiford, R. B.: Metabolic Rate, 203
Boothby, W. M.: See Plummer, H. S.
Borchers, E.: Vagotomy and Stomach, 573
Borde, M.: Glucose Estimation, 109
Bordet, J.: Blood Coagulation, 567
Bordet, J., and Ciuca, M.: Phagocytosis, 91
Boresch, K.: Cyanophyceæ and Light, 159; Schizophyceæ Pigments, 531
Borkowski, R.: Root Oxidation, 100
Bornemann: CO_2 and Plant Growth, 230
Bornstein, A.: Adrenaline Glycæmia, 273; Morphine Antidotes, 390
Bornstein, A., and Vogel, R.: Blood after Pilocarpine, 389; Parasympathetic, 580
Borsche, W., and others: Bile Acids, 477
Boruttau, H., and Cappenberg, H.: Shepherd's Purse, 337
Borzi, A.: Ecology of Oxalis, 232
Bossert, O., and Gralka, R.: Myographic Studies, 179
Bostrom, E. F.: Red Cell Distribution, 624
Botazzi, F.: Composition of Invertebrates, 113; Muscle Cold Contraction, 118
Bottazzi, F., and others: Vitamins, 508
Botzian, R.: Serum Bilirubin, 39
Bouckaert, J.: K-ion and Vagus, 559
Bourguignon, G.: Chronaxie and Poisons, 642; Chronaxie in Degeneration, 304; Reflex Repercussion, 488
Bourguignon, G., and Banu, G.: Chronaxie in Rickets, 246
Bourguignon, G., and Tupa, A.: Muscle Chronaxie, 619
Bourguignon, G.: See Banu, G.
Bourquelot, E., and Bridel, M.: Gentiobiase, 97; Inulin, 351; Inulin Hydrolysis, 535
Boutwell, P. W.: See Steenbock, H.
Bouyoucos, G.: Soil Moisture, 345, 346
Bouyoucos, G. T., and McCool, M. M.: Seeds and Soil Water, 540
Bowditch, H. I.: See Strongman, B. T.
Bowers, W. S.: See McClendon, J. F.
Boycott, A. E.: Manganese in Mollusca, 614
Boyer, L.: See Ravaut, P.
Brabant, V.: Muscarine and Derivatives, 333
Brabant, V. G.: Nystagmus, 307
Brachet, A.: Review, 608
Bradford, S. C.: Gels, 404
Bradley, H. C.: Brain Autolysis, 185
Bradley, H. C., and Elliott, W.: Protein in Urine, 209
Bradley, H. C.: See Gibson, C. A.
Brahmachari, U. N., and Sen, P.: Quinine Hæmolysis, 524
Braman, W. W.: See Armsby, H. P.
Brammertz, W.: See Abderhalden, E.
Bramson, J.: Muscle Relaxation, 303
Brandes, E. W.: Sugar Cane Mosaic, 464
Braun, H.: Seed Soaking, 463
Brauns, D. H., and MacLaughlin, J. A.: Phosphatide Estimation, 9
Breazeale, J. F.: See Le Clerc, J. A.
Breinl, A.: Moist Atmosphere, 349
Brel, J.: Urinary Nitrogen after Adrenalin, 638
Bremer, F., Patellar Reflex, 21
Bresslau, E.: Membrane of Infusoria, 297
Brett, P. C.: See Spence, J. C.
Brewster, J. F.: Peptic Activity, 171
Bridel, M.: Enzyme Action, 535; Ethyl Galactoside, 647
Bridel, M.: and Arnold R.: Emulsion Precipitation, 13; Plant Glucose, 459
Bridel, M.: See Bourquelot, E.
Briggs, A. P., and Schaffer, P. A.: Acetone Excretion, 631
Briggs, G. E., and others: Plant Growth, 98, 160
Briggs, H.: Uterus Exudate, 586
Bright, E. M.: See Aub, J. C.
Bright, E. M.: See Redfield, A. C.
Brigl, P.: Glucose Formula, 473
Brinchmann, A.: Anæmia, 597
Brinkman, R.: Resistance of Red Cells, 422
Brinkman, R.: See Creveld, S. v.
Brinkman, R., and Dam, E. van: Calcium and Stomach Movements, 632; Surface Tension, 609
Brioux, C.: Soil Phosphate: 398
Brissaud, E.: See Widal, F.
Brock, S.: See Kay, W. E.
Brocq, P.: See Binet, L.
Brodin, P.: See Chauffard, A.
Brody, S.: Ovulation in Fowl, 216; Growth of Fowl, 439
Brody, S., and Ragsdale, A. C.: Growth of Cow, 320
Broeke, C. v. d.: See Leeuwen, W. S. van.
Broemser, P.: Combination Tones, 28; Nerve Resistance, 619; Nerve Velocity, 121
Broemser, P., and Hahn, A.: Glucose Excretion, 637
Broemser, P.: See Barkan, G.
Bromig, K.: See Amberger, C.
Brooks, C., and others: Apple Storage Diseases, 104
Brooks, H.: Hyperthyroidism, 271
Brooks, M. M.: Bile Salts, etc., on Respiration, 461; La on Plant Respiration, 541
Brösamlen: Adrenalin Hyperglycæmia, 636
Brown, B. E.: See Blair, A. W.

Brown, E. D.: Poison Ivy, 390
Brown, N. W.: Thyroid Activity, 146
Brown, T. R.: Pancreatic Juice in Sprue, 283
Brown, W. E. L., and Hill, A. V.: Cl of Blood, 130; Electrode E.M.F., 108
Brown, W. H.: Fibre Plants, 94
Brown, W. H., and Merrill, E. D.: Palm Products, 94
Brown, W. H.: Review, 106
Browne, F. J.: Anencephaly, 73
Browning, C. H., and Gulbransen, R.: Acriflavine, 217
Browning, C. H., and others: Constitution and Antisepsis, 79
Browning, W.: Moral Centre, 360
Brücke, E.: Central Inhibition, 22
Brücke, E. T.: Toad Skin Innervation, 619
Brues, C. T., and Glaser, R. W.: Symbiosis, 411; Symbiotic Fungus, 543
Brugnatelli, E.: Ovary Cells, 301
Brugsch, T., and others: Medulla Metabolism, 67
Brulé, M.: Bile-Duct Obstruction, 199; Urobilin, 445
Brunacci, B., and Noferi, U.: Bile Secretion, 433
Bruni, G.: Solubilities in Caoutchouc, 286
Bruno, A.: Borax and Vegetables, 464
Bruns, O.: Abdominal Reflex, 53; Circulation in Work, 427
Brunswik, H.: Chitosan, 394; Raphides, 95
Brusselmans, P.: Colloid Shock, 594
Bruyn, E. M. M., and Van Nifterik, C. H. M.: Frog Reflexes, 492
Bruynoghe, R.: Bacteriophages, 393; Poisonous Fungi, 596
Buch, H.: Tropisms of Liverwort, 165
Buchanan, J. A.: S-T Interval, 570
Buchanan, J. A., and Higley, E. T.: Blood Groups, 625
Buckley, D.: See Ferree, C. E.
Buckman, T. E., and Hallisey, J. E.: Platelet Counting, 129
Buckmaster, G. A.: Hæmoglobin and CO_2, 195
Buckner, G. D., and others: Growth and Diet, 58; Nitrates for Plants, 287
Buddenbrock, W. v.: Muscle Tonus, 115
Buder, J.: Phototropisms, 165
Buell, M. V.: See Steenbock, H.
Bulger, H. A.: Hæmophilia, 36
Bulger, H. A.: See Drury, A. N.
Bulger, H. A.: See Lewis, T.
Bullis, D. E.: See Jones, J. S.
Bullis, D. E.: See Robinson, R. H.
Bulliard, H.: Transfusion, 253
Buller, A. H. R.: Sporangiophores, 648
Bunting, C. H.: Platelets, 36
Bunting, C. H. and Huston, J.: Fate of Lymphocyte, 367
Burge, E. L.: See Burge, W. E.
Burge, W. E., and Burge, E. L.: Catalase and Age, 235
Burge, W. E., and Leichsenring, J.: Catalase, 205
Burge, W. E., and Leichsenring, J. M.: Catalase, 410
Bürger, M.: Blood Cells and Sugar, 206; Creatinin Metabolism, 205; Exercise in Diabetes, 52; Uric Acid in Gout, 90
Bürger, M., and Hagemann, E.: Sugar Injections, 50
Bürgi, E.: Vitamins, 375
Bürker-Giessen, K.: Hb and Red Cell Counts, 255
Burnet, J.: Dried Milk for Infants, 140
Burnett, T. C.: Muscle Catalase and Liver, 246
Burns, D.: Review, 545
Burns, J. C.: Cottonseed for Hogs, 139
Burns, W., and Chakradev, G. M.: Ecology of Deccan, 343
Burridge, W.: Carbon Dioxide on Heat, 192; Frog Heart Perfusion Fluid, 312; Heart Antagonism, 192
Burrows, M. T.: Energy of Embryo Tissues, 244
Burton, E. F.: Review, 465
Burton-Opitz, R.: Venous Supply of Heart, 627
Burtt, H. E.: Respiration Ratios, 548; Sexes in Discussions, 31;
Burtt, H. E., and others: Psychological Investigations, 421
Burwell, C. S., and Jones, C. M.: Bile and Blood in Urine Tests, 444
Busacca, A.: Ganglion Cell Growth, 301
Büscher, J.: Blood Sedimentation, 366
Buston, H. W., and Schryver, S. B.: Amino-Acid Separation, 610
Butler, O. R., and others: Apple Physiology, 98
Butt, N. I.: See Harris, F. S.
Buytendijk, F. J. J.: Habits in Snail, 493; Intelligence of Monkeys, 30; Smell in Dog, 492
Byall, S.: See Kopeloff, N.
Bylsma, U. G.: Vuzine and Eucupine, 81
Byrne, J.: Paradoxical Pupil Dilatation, 249

Cady, L. de: Sinoventricular Bundle, 312
Caillard, K.: See Grenet, H.
Caille, E.: See Chiray, M.
Cajal, S. Ramon: Nerve Regeneration, 247
Calderone, A.: Phagocytosis, 117
Caldwell, R. E.: Milk Substitute, 58
Caldwell, W. E., and Lyle, W. G.: Blood in Pregnancy, 450
Calkins, G. N.: Uroleptus Sections, 552
Calloway, J. T.: See Bartholomew, R. A.
Calvert, E. G. B., and others: Diabetic Acidosis, 143
Calvin, J. K.: Goat's Milk, 588
Calwell, W.: Psychology in Hospital, 251
Cameron, A. T., and Carmichael, J.: Parathyroid and Thyroid, 638; Thyroid Feeding, 69, 211; Thyroxin Feeding, 211; Thyroxin and Growth, 326
Cameron, A. T., and Sedziak, F. A.: Benzene Reflex, 184; Thyroid Feeding, 638
Camis, M.: Hæmoglobin Aggregation, 476
Cammerloher, H.: Stomata of Parasites, 158
Cammidge, P. J., and others: Blood Sugar, 514; "Difference Values" of Blood, 270
Campbell, H. L.: See La Mer, V. K.
Campbell, J. A., and others: Cooling and Metabolism, 440
Campbell, J. A., and Webster, T. A.: Urine Changes, 637
Campbell, J. A. C.: See Hill, L.
Camus, J., and Roussy, G.: Adiposo-Genital Syndrome, 383; Pituitary, 72
Cann, I.: See Lenoble, E.
Cannon, W. B., and Rapport, D.: Adrenal Secretion, 639; Heart Rate, 639
Cannon, W. B., and Uridil, J. E.: Heart and Liver, 639
Cano, J. M., and Ranedo, J.: Amino-Alcohols as Anæsthetics, 278
Cappenberg, H.: See Boruttau, H.
Cardot, H.: See Richet, C.
Carey, E. J.: Histogenesis, 179, 617; Histogenesis of Muscle, 482; Small Intestine Structure, 261
Carlson, A. J., and Luckhardt, A. B.: Lung Reflexes, 45; Œsophagus and Vagus, 504; Vascular Reflexes, 122; Visceral Sensory System, 248
Carlson, A. J.: See Luckhardt, A. B.
Carmichael, J.: See Cameron, A. T.

Carnot, P., and others: Urease Effects, 220; Urinary Excretion, 323
Carothers, E. E.: Heteromorphic Chromosomes, 301
Carpenter, T. M.: Review, 465
Carr, A. D.: Water Diuresis, 581
Carr, R. H., and Hoffmann, L.: Corn Crops, 99
Carr, R. H., and Phares, V. R.: Indiana Soils, 103
Carr, R. H.: See Philips, A. G.
Carrel, A.: Heart Operations, 570; Wound Cicatrisation, 597
Carrel, A., and Du Noüy, P. L.: Wound Healing, 482
Carrel, A., and Ebeling, A. H.: Age and Growth of Tissues, 617; Fibroblast Growth, 481
Carrel, A.: See Ebeling, A. H.
Carrero, J. O.: See Gile, P. L.
Carrier, E. B.: See Whipple, G. H.
Carrieu and others: Alcohol in Cerebro-Spinal Fluid, 493
Carrieu: See Ducamp.
Carroll, W. E.: Horse Feeding, 262
Carter, C. L.: Mutton-Bird Oil, 550
Carter, E. G.: See Greaves, J. E.
Cary, C. A.: Blood Amino-Acids, 216
Cary, W. E.: Alkali for Diabetes, 323
Caspari, W.: Metabolism in Tropics, 266
Castex, E.: Knee Jerk, 470
Castro, F. de: Neuroglia, 20
Castronuovo, G.: Blood Platelets, 496
Catán, M. A.: See Damianovich, H.
Cate, C. C.: See Lewis, C. I.
Cathcart, E. P.: Review, 105
Cattell, McK.: See Forbes, A.
Cattaneo, D.: Giant Cells, 616
Cavalieri, R.: See Verdozzi, C.
Cavazzani, E.: Urine Protein Tests, 209; HCNS Functions, 405
Cave, H. W.: See Hughes, J. S.
Celano, L.: See Barber, W. H.
Ceni, C.: Cerebrum and Thyroid, 326; Thyroid and Cerebrum. 272
Censi Mancia, G. B.: Ruminant Stomach, 373
Cerighelli, R.: Root Respiration, 290
Cessna, R.: See Nelson, V. E.
Chabanier, H., and others: Diabetic Diet, 322
Chabot, C., and Van Laer, H.: Malt, 537
Chabrol, M.: See Tournade, A.
Chahovitch, X.: See Couvreur, E.
Chailley-Bert, P., and others: Second Wind, 372
Chailley-Bert, P., and Langlois, J. P.: Blood-Pressure in Work, 258
Chakradev, G. M.: See Burns, W.
Chambers, R.: Aster in Parthenogenesis, 523; Starfish Egg, 479
Champy, C.: Sex Characters and Testis, 149
Sex Mutation, 328; Tissue Cultures, 116
Champny, C.: See Anthony, R.
Chandler, L. R.: Anæmia of Liver, 55; Hæmochromatosis, 89
Chandler, L. R.: See Schultz, E. W.
Chapin, R. M.: Cresol Determinations, 403
Charlton, H. H.: Spermatogenesis, 176
Chatton, E.: Myogenesis, 302; Mitosis, 554
Chatton, E., and Courrier, R.: Trypanosome of Goitre, 335
Chauchard, A.: Narcotics on Nerve Excitability, 278
Chaudun, A.: See Colin, H.
Chauffard and others: Liver and Uric Acid, 157
Chauffard, A., and others: Cholesterol Cycle, 267; Liver Cirrhosis, 379
Chaussin, J.: Urine Excretion, 64
Chaves, P. R.: Cytology of Pancreas and Liver, 177, 178; Hedgehog Liver, 356
Chelle, L.: HCN Estimation, 8
Cheney, G.: See Smith, P. E.
Cheplin, H. A., and Rettger, L. F.: Intestinal Flora, 92
Chevalier, A.: See Porcher, C.
Chibnall, A. C., and Schryver, S. B.: Leaf Proteins, 285
Chick, H.: See Dalyell, E. J.
Chidester, F. E.: Fish Migration, 294
Chievitz, I.: Gastric Juice of Infants, 504
Child, C. M.: Axial Gradients, 410; Morphogenesis in Planaria, 299; Physiological Gradients, 2
Child, C. M.: See Robbins, H. L.
Chiray, M., and Caille, E.: Glucuronic Liver Test, 576
Chistoni, A.: Blood Serum Reaction, 497; Ichthyol as Anticoagulant, 83; Lymphogenesis, 522; Sparteine, 525
Chodat, F.: Red Cell Antigen, 566
Chopin, M.: Humidity of Cereals, 285
Chosson, P.: See Couvreur, E.
Chou, S. S.: See Steudel, H.
Christman, A. A., and Lewis, H. B.: Liver Lipase, 409
Christy, M.: Flower Opening, 542
Church, A. H.: Lichens, 336
Ciaccio, C.: Amino-N by Formol, 471
Ciamician, G., and Ravenna, C.: Drugs on Plants, 336; Plant Alkaloids, 284
Cicconardi, G.: Cold on Kidney Structure, 637
Citron, H.: Acetone Test, 145; Acetonuria, 270
Ciuca, M.: See Bordet, J.
Claret, de: See Ducamp.
Clark, A. B.: See Lloyd, D. J.
Clark, A. B.: See Raistrick, H.
Clark, A. J.: Absorption from Peritoneal Cavity. 134
Clark, A. J.: See Daly, I. de B.
Clark, C. A.: Deglutition Apnœa, 195
Clark, E. L., and Clark, E. R.: Œdema and Lymphatics, 259
Clark, E. P.: Galactose, 351
Clark, E. P.: See Levene, P. A.
Clark, E. R.: See Clark, E. L.
Clark, G. A.: See Atkinson, M.
Clark, G. W.: Blood Ca, 253
Clark, H. M., and Evans, F. A.: Hæmolysis, 282
Clark, H. M., and others: Antihæmolysins, 598
Clark, J. H.: Light and Leucocytosis, 35
Clark, T.: Malnutrition in Children, 266
Clark, W. E. Le G.: Pacchionian Bodies, 32
Clarke, J. R.: See Mottram, T. C.
Clarke, R. H., and Henderson, E. E.: Review, 105
Claudius, M.: Chemical Relationships, 323
Clausen, S. W.: Lactic Acid, 188
Clayson, D. H. F., and others: Plant Cell Walls, 645
Clerc, A., and Pezzi, C.: Adrenalin and Quinine, 82; Cellular Work, 179
Clementi, A.: Erepsin and Substrate, 54; Protamines and Histones, 20
Clevers, J.: Thyroid in Immunity, 519
Clifford, W. M.: Carnosine, 406
Cloetta, M.: Digitoxine, 81
Clogne, R., and Richard, A.: Blood-Sugar, 269; Saliva, 260
Clouston, D., and Plymen, F. J.: Bamboo as Food, 57
Clowes, G. H. A., and Bachman, E.: Sperm Stimulant, 115, 214
Clowes, G. H. A., and others: Adsorption by Fuller's Earth, 173
Cluzet, J., and others: Pyocyanin, 477
Cluzet: See Latarjet.

Cobb, S.: See Forbes, A.
Cobet, R.: Intestinal Absorption, 198
Coburn, R. C.: See Henderson, Y.
Cohen, B.: See Smith, A. H.
Cohen, C.: See Neuberg, C.
Cohen, J. B.: See Browning, C. H.
Cohn, A. E., and Levy, R. L.: Quinidine on Heart, 524
Cohn, E. J.: Protein Characters, 173
Cohn, F.: Lactacidogen, 484
Coit, J. E.: See McClatchie, A. J.
Cole, A. E.: Oxygen Supply in Lakes, 176
Cole, H. N., and others: Mercury Injections, 217
Cole, S. W., and Adie, W. J.: Gastric Analysis, 54
Cole, W. H.: See Moore, A. R.
Colebrook, L.: See Douglas, S. R.
Colebrook, L.: See Wright, Sir A. E.: Review
Coleman, W.: Diet for Gastric Ulcer, 155
Colin, H.: Inulins and Sucrase, 97; Laws of Hydrolysis, 395
Colin, H., and Chaudun, A.: Molecular Weight, 535
Collander, R.: Electric-Osmotic Processes, 110; Thermotropisms, 165
Collatz, F. A., and Bailey, C. H.: Phytase, 536
Collett, M. E.: Acids and Infusoria, 353, 354
Collett, R. L.: Fungus Spores, 648
Collier: Chemical Relationships, 300
Collier, W. A.: Auto-Noxins, 393
Collin, R.: Pacini Corpuscles, 419
Collins, E. T.: Eye and Erect Posture, 621
Collip, J. B.: Adrenaline Depressor Action, 274; Acid-Base Equilibrium, 196; Blood Alkali Reserve, 196; Calcium and Tetany, 23; Cœlomic Fluid, 16; Gastric Acid, 574
Colville, F. V.: Cold on Plants, 463
Combes, R.: Plant Glucosides, 161
Compton, A.: Reaction and Enzymes, 96
Compton, A.: See Bertrand, G.
Comrie, J. D.: Renal Efficiency Tests, 637
Connell, K.: See Dunn, A. D.
Conran, P.: Meat in Sprue, 90
Constabel, F.: Creatine of Heart, 487
Cook, M. H., and Neal, H. V.: Taste Buds, 126
Cooley, J. S.: See Brooks, C.
Coombs, H. C.: See Hastings, A. B.
Coons, G. H.: Potato Diseases, 346
Coope, R.: Sugar of C.S. Fluid, 564
Cooper, A. R., and Groot, J. T.: Ciliary Ganglion, 402
Cooper, E.: Vitamin of Orange Peel, 435
Cooper, E. A.: Denitrification, 460
Cooper, E. A., and Walker, H.: Blood Sugar, 441
Cooper, E. A.: See Morgan, G. T.
Coover, J. E.: See Stratton, G. M.
Corbett, L. C.: Pruning, 232
Cordes, F.: See Macheus, A.
Cori, K.: Diuresis and Intravenous Injections, 269; Frog Heart and Vagus, 568
Corinaldesi, S.: Blood and Diet, 267
Corner, G. W.: Migration of Ovum, 276; Œstrus Changes, 449
Corral, J. M. de: Blood Reaction, 252; Temperature and Blood Reaction, 309
Costa, C. da: Suprarenal Development, 212
Costantino, A.: Blood Amino-Acids, 368; CO_2 Elimination, 517; Sugar Fermentation, 536
Cotton, A. D.: Potato Disease, 398, 607
Cotton, T. F.: See Feil, H. S.
Coulter, C. B.: Complement, 457; Hæmagglutination and P_H, 34; Hæmolysis, 190
Coupin, H.: Plant Starvation, 291; Geotropism, 541
Courrier, R.: Testis Interstitial Cells, 329; Interstitial Glands, 640; Sex Characters of Fish, 449
Courrier, R.: See Chatton, E.
Courtonne, H.: Chlorides and Starch, 8; Salts and Starch Grains, 285
Couturier, H.: See Lumière, A.
Couvreur, E.: Nerve Section, 359
Couvreur, E., and Chosson, P.: Vegetable Rennins, 386
Couvreur, E., and Chahovitch, X.: Invertebrate Infections, 243
Cow, D.: See Dixon, W. E.
Cow, D. V.: Obituary, 347
Coward, K. H., and Drummond, J. C., 508
Coward, K. H.: See Drummond, J. C.
Coward, K. H.: See Zilva, S. S.
Cowdry, E. V.: Blood Cell Reticulum, 117; Cytological Names, 553; Flagellated Thyroid Cells, 638
Cowgill, G. R.: Vitamin and Secretion, 264; Vitamin B. 577; Vitamins, 509
Cowgill, G. R., and Mendel, L. B.: Vitamin B, 634
Cragg, F. W.: Bug Reproduction, 411
Craigie, E. H.: Cerebrum Vascularity, 360
Cramer, C. D.: Menstrual Anaphylaxis, 392
Cramer, W., and others: Lymphoid Tissues 633; Vitamins and X Rays, 265
Crane, M. M.: See Marshall, E. K.
Crawford, A. C., and George, J. M.: Vasomotors and Penis, 276
Craybill, H. R.: See Rose, D. H.
Creveld, S. v.: Chlorine in Blood, 626
Creveld, S. van, and Brinkman, R.: Blood Sugar, 441
Creveld, S. v.: See Haan, J. de.
Crile, G. W.: Liver in Shock, 456; Shock, 89; Thyroid and Suprarenals, 70
Cristol, P.: Ca Estimation, 311
Cristol, P.: See Carrieu.
Cristol: See Galavielle
Crohn, B. B., and others: Lyon Duodenal Test, 373
Croll, H. M.: See Myers, V. C.
Cron, R. S.: Glycosuria in Pregnancy, 442
Crouter, C. Y.: See Hendrix, B. M.
Crozier, W. J.: Adaptation, 17, 402, 412; Onchidium, 16
Cruess, W. V., and others: Frozen Fruit, 397
Csépai, K.: Papaverine and Adrenaline, 274; Adrenaline Sensitiveness, 584
Cullis, W. C., and Hewer, E. E.: Ammonia of Pregnancy, 79
Culpepper, W. L.: Blood Groups, 128
Cummins, A. B.: See Kelley, W. P.
Cummins, H. A.: Pollination, 232
Cunningham, T. D.: See Aub, J. C.
Curatolo: Vitamins of Urine, 59
Curry, B. E.: See Butler, O. R.
Curtman, L. J., and Hart, D.: Uric Acid Salts, 240
Cushing, H.: Pituitary Disorders, 382
Cushing, H., and Foley, F. E. B.: Cerebro-Spinal Pressure, 32
Cushny, A. R.: Hyoscine and Hyoscyamines, 153
Cushny, A. R., and Lambie, C. G.: Diuretics, 453
Cutler, D. W.: Parthenogenesis, 77
Cutting, E. M.: Heterothallism, 289
Czapek, F.: Plant Lipoid, 159
Czoniczer, G.: Uric Acid in CO Poisoning, 39
Czoniczer, G.: See Thannhauser, S. J.

Daels, F.: Purgatives, 388
Dahle, C. D.: See Dutcher, R. A.
Dakin, H. D.: Amino-Malic Acids, 550; Physiological Oxidations, 473
Dale, H. H.: Chemotherapy, 151

Dale, H. H., and Dudley, H. W.: Iminazol Bases, 590; Pituitary and Histamine, 584
Dale, H. H., and Hill, L.: N_2O Anæsthesia, 451
Dale, H. H., and Kellaway, C. H.: Anaphylaxis, 155
D'Alise, R.: Saliva Reaction, 503
Dallman, A. A.: Primrose Pollination, 649
Dalmeyer, J. J.: See Snapper, I.
Daly, I. de B., and Clark, A. J.: Ions on Heart, 192
Daly, I. de B.: See Anrep, G V.
Dalyell, E.: Vitamins, 139
Dalyell, E. J., and others: Hunger Osteomalacia, 508
Dam, E. v.: See Brinkman, R.
Damianovich, H.: Vitamin B., 436
Damianovich, H., and Catán, M. A.: Vitamins, 202
Damiens, M. A.: Tissue Bromine, 352
Damon, S. C.: See Hartwell, B. L.
Danchakoff, V.: Tumours in Embryo, 599
Dandy, W. E.: Hydrocephalus, 308
Dangeard, A. P.: Alga in Darkness, 538
Daniel, A.: Fructose, 434
Daniel, L.: Potato Grafts, 288; Grafts, 538
Danielopolu, D., and Danulesco, V.: Cardiac Studies, 428
Danisch, F.: Vorticella Reactions, 479
Danulesco, V.: See Danielopolu, D.
Darling, S. T., and Smillie, W. G.: Hookworm, 282
Dart, A. E.: See Schmidt, C. L. A.
Dauber, M.: Quitenine and Quinchotenine, 81
Daudt, H. W.: Kjeldahl Method, 350
Daughters, M. R.: Loganberry, 159
Dausset, H., and Boiget: Fatigue Curves, 235
Dautrebande, L., and Haldane, J. S.: Oxygen Respiration, 431
Davenport, A.: See Fred, E. B.
Davey, A. J.: Fruit Juice and Scurvy, 265
Davidson, E. C.: See Dieuaide, F. R.
Davies, D. S.: See Gunn, J. A.
Davis, A. R.: Plant Cultures, 340
Davis, A. R., and Benedict, S. R.: Uric Acid Compound, 188
Davis, L. H., and Ross, E. L.: Blood Diastases, 269
Davis, L. H.: See Ross, E. L.
Davis, K.: Snow and Plant Growth, 342
Davis, N. C.: Liver Necrosis, 451
Davis, N. C., and Whipple, G. H.: Liver Necrosis, 387
Dawson, J. A.: See Smith, A. H.
Dawson, P. M., and Kupperman, F. V.: Cardiomuscular Indices, 169
Dawson, P. M., and Ostlund, E. O.: Nerve Heart Block, 181
Dawson, P. M., and others: Centre of Gravity, 169
Dawson, P. M., and Wallrich, L. A.: Rest and Efficiency, 169
Dawson, P. M.: See Ostlund, E. O.
Dawson, P. M.: See Wallrich, L. A.
Dawson, P. R.: See Sullivan, M. X.
Day, E. C.: Tunicate Nervous System, 354
Debray, R.: See Loeper, M.
Decker, G. de: See Waller, A. D.
Deeds, F.: See Morris, J. L.
Degkwitz, R.: Platelets, 35
Dehn, W. M., and Taylor, M. C.: Frozen Fruit, 94
Dehorne, A.: Spermatogenesis, 149; Mitosis in Corethra, 241
Dejust, L.: Mucin Precipitation, 12
Dekhuysen, G.: Semipermeability of Sipunculids, 15
Dekhuyzen, M. C.: Marine Animals, 354
Delauney, P.: Orchid Glucosides, 285
Delcourt-Bernard, E.: Peptone and Phagocytes, 566
Delf, E. M.: Cooking and Vitamins, 203; Plant Vitamins, 263
Demel, A. C.: Blood Cell Structure, 494
Demolon, A.: Soil Reaction, 464
Demoor, J.: Cerebral Localisation, 560; Heart and Thyroid, 382; Radioactivity, 235
Demoussy, E.: See Maquenne, L.
Denecke, G.: See Morawitz, P.
Denis, W.: Turbidimetry, 350
Denis, W., and Sisson, W. R.: Chloride of Milk and Blood, 318
Denis, W.: See Sisson, W. R.
Dennig, H.: Refractory Phase, 41
Denny, G. P.: Blood Volume in Anæmia, 128
Dériaud, R.: See Banu, G.
Dernby, K. G.: H-ion and Bacteria, 539
Dervieux: Blood and Semen Tests, 328
Deschamps, A.: See Fredericq, H.
Desgréz, A., and Bierry, H. N.: Equilibrium and Carbohydrate, 58; Vitamins and Rations, 263
Desgréz, A., and Moog, R.: Amylase Action, 113
De Souza: See Lyle, H. W.: Review.
Detwiler, S. R.: Nerve Centre Hyperplasia, 489; Spinal Hyperplasia, 560
Detwiler, S. R., and Laurens, H.: Visual Cell Histogenesis, 621
Deuel, H. J.: See Holmes, A. D.
Deusch, H.: Blood in Myxœdema, 69
Deutler, M. L.: See Wang, C. C.
Deutschland, A.: See Völtz, W.
Devrient, W.: Salicylic Acid Fate, 439
De Young, I. M.: See McKellips, G. M.
Dezani, S.: HCNS in Plants, 459
D'Halluin, M.: Electrocution, 455
Dhar, N. R.: Temperature Coefficient, 295
Dhéré, C.: Hæmocyanine, 12
Dhéré, C., and Schneider, A.: Hæmocyanine, 239
Diebschlag, E.: Blood Glycuronic Acid, 627; Glycuronic Acid, 516
Diebschlag, E.: See Stepp, W.
Dick, S. M.: See McClendon, J. F.
Diehl, E.: Heat Regulation, 84
Dienes, L.: Nitrogen Assimilation, 635
Dietrich, W.: See Völtz, W.
Dietrich, W.: See Windisch, W.
Dieuaide, F. R.: Heart Axis, 427
Dieuaide, F. R., and Davidson, E. C.: Moribund Heart, 628
Dill, D. B.: Sardine and other Fish, 507
Dirken, M. N. J.: Blood Pressure Apparatus, 236, 470; Gas Analysis Apparatus, 470; Metabolism in Sculling, 372
Dirken, M.: See Waterman, N.
Dishoeck, A. F. C. v.: Light on Fungi, 541
Ditthorn, F.: Cresol Disinfection, 163
Dittler, R.: Sterilisation by Spermatozoa, 77
Dixon, H. H., and Ball, N. G.: Heat of Inversion, 14
Dixon, W. E., and Cow, D.: Cerebro-Spinal Fluid, 31
Dixon, W. E., and Ransom, F: Action of Volatile Substances, 217
Djermanovitch, M.: See Giaja, J.
Dobkiewicq, L. v.: See Romeis, B.
Dock, W.: See Asami, G.
Dodel, P.: Attention, 623
Dodds, E. C.: Alveolar Air and Meals, 195
Dodds, E. C.: Gastro-Intestinal Secretion, 432
Dodds, E. C., and Bennett, T. I.: Alveolar Air and Meals, 572
Dodds, E. C.: See Bennett, T. I.
Doerr, R.: Oligodynamy of Ag, 219
Doerr, R., and Berger, W.: Immunity Precipitate, 612
Döhring, E.: See Atzler, E.

Doi, Y.: Anoxic Anæmia, 316; Hæmorrhage and Transfusion, 425; Muscle Contraction, 179; Muscle Length and Heat-Production, 303
Doisy, E. A., and Bell, R. D.: Blood Sodium, 40
Doisy, E. A., and Eaton, E. P.: Blood Ion Exchange, 431
Doisy, E. A.: See Bell, R. D.
Dold, H.: Organ Extracts, 448
Donegan, J. F.: Vein Innervation, 429
Dooley, M. S.: Digitalis Principles, 387
Dore, W. H.: Wood Analysis, 94
Dorée, C.: Sea-Water and Textiles, 95
Dorello, P.: Reciprocal Innervation, 559
Dorlencourt, H., and others: Iodine and Leucocytes, 386
Doubler, F. H.: See Asher, L.
Douglas, S. R.: Bacterial Digests, 460
Douglas, S. R., and Hill L.: Mass Infection, 157
Douglas, S. R., and others: Wound Infections, 93
Douglass, A. E.: Tree Growth, 342
Dowell, C. T.: See Menaol, P.
Dowell, S. T.: Rabbit Fat, 579
Downs, A. W., and Eddy, N. B.: Secretin in Anæmia, 634
Downs, A. W.: See Eddy, N. B.
Dox, A. W., and Yoder, L.: Silage, 460
Doyon: Antithrombin, 310; Blood Coagulation, 37; Nucleic Acid and Coagulation, 296; Nucleic Acid as Anticoagulant, 626; Nucleic Acids, 237
Dozzi, L.: Uric Acid, 9
Dragoiu, J., and Fauré-Frémiet, E.: Thyroid Feeding, 446
Dragoiu, J., and Vlès, F.: Mitosis and Osmosis, 301
Dragoiu, J.: See Fauré-Frémiet, E.
Dragoiu, J.: See Vlès, F.
Draper, G.: Reversive Sex Phenomena, 276
Dresel, K.: See Brugsch, T.
Dresel, P., and Ullmann, H.: Purin Metabolism, 516
Drew, A. H.: See Cramer, W.
Dreyer, G.: Blood Counts, 470; Red Cell Counts, 4
Dreyer, G., and others: Variations in Hb, 33
Dreyer, G., and Ward, H. K.: Syphilis Reaction, 284
Drinker, C. K., and Shaw, L. A.: Distribution of Particles, 129
Drinker, C. K.: See Lund, C. C.
Drouin, H.: Inhibition and Sn Salts, 246
Drouin, H.: See Grenet, H.
Drummond, J. C., and Coward, K. H.: Fat-Free Diet, 509; Oxidation of Vitamins, 60
Drummond, J. C., and others: Vitamins, 60; Milk and Butter, 508
Drummond, J. C.: Lard Vitamins, 577
Drummond, J. C.: See Anrep, G. V.
Drummond, J. C.: See Coward, K. H.
Drummond, J. C.: See Zilva, S. S.
Drury, A. N., and Lewis, T.: Auricle Excitation, 131
Drury, A. N., and others: Quinidine in Fibrillation, 498; Vagus and Auricle, 191
Drury, A. N.: See Feil, H. S.
Drury, A. N.: See Lewis, T.
Drury, D. R.: See Addis, T.
Drzewina, A., and Bohn, G.: Action of Waters, 333; Dose and Number, 113; Protective Reactions, 243; Resistance to Drugs, 333
Dubin, H. E.: See Funk, C.
Dubois, C.: See Battez, G.
Dubois, C.: See Wertheimer, E.
Du Bois, E. F.: Fever Metabolism, 438
Dubois, R.: Metochondia, 158
Dubreuil, G., and Anderodias: Langerhans' Islets, 143
Ducamp, and others: Effects of Alcohol in C.S. Fluid, 308
Ducceschi, V.: Effects of Alcohol, 330
Duclaux, J.: See Wurmser, R.
Duchon, F.: See Nemec, A.
Dudgeon, W.: Gangetic Plain Ecology, 102
Dudley, H. W.: Glycylcholine, 407
Dudley, H. W., and Evans, C. L.: Hæmoglobin Crystallisation, 476
Dudley, H. W.: See Dale, H. H.
Duhot, E., and Gernez, C.: Surface Tension of Urine, 445
Duhot, E.: See Polonowski, M.
Duke, W. W.: Food Allergy, 456
Dunham, G. C.: See Spaeth, R. A.
Dunlap, K.: Light-Spot Adaptation, 184
Dunlap, K., and Snyder, A.: Intelligence Tests, 31
Dunn, A. D., and Connell, K.: Hepato-Duodenostomy, 505
Dunn, H. L.: Fœtal Growth, 560
Dunn, S. T.: Camphor Yield, 397
Dünner, L.: Phosphaturia, 157
Durham, H. E.: Bean Sowing, 460; Thyroid Enlargement, 146
Durrans, T. H.: Olfaction Theory, 251
Dustin, A : Thymus, 272
Dustin, A. P.: Effect of Foreign Serum, 302; Thymus Mitosis, 382
Dutcher, R. A., and others: Vitamins, 61
Dutcher, R. A.: See Pierson, E. M.
Dutcher, R. A., and Wilkins, S. D.: Vitamins, 577
Dutcher, R. A.: See Anderson, E. V.
Duverger, C., and others: Retinal Artery Pressure, 124
Duvillier, E.: See Wertheimer, E.
Dye, M.: See Blunt, K.
Dyer, H.: Silver Arsphenamine, 388
Dyk, H. v.: Malarial Inoculation, 393

Eaton, E. P.: See Doisy, E. A.
Ebaugh, F. G., and Hoskins, R. G.: Dystrophia Adiposogenitalis, 149
Ebbecke, U.: Central Inhibition, 124; Capillary Circulation, 571; Colour-Blind Margin, 124; Entoptic Phenomena, 124; Galvanic Skin Reactions, 482; Momentary Vision, 124; Vascular Reflexes, 559
Ebeling, A. H.: Fibrin-Serum Culture Fluid, 356; Tissue Cultures, 481
Ebeling, A. H., and Carrel, A.: Cornea Transplantation. 561
Ebeling, A. H.: See Carrel, A.
Eberstadt, O.: See Knoevenagel, E.
Echols, G. L.: See Tanner, W. F.
Eck, P. N. v.: Blood in Fæces, 369
Ecker, E. E., and Goldblatt, H.: Thyroid and Immunity, 519
Eckler, C. R.: Cotton Root Bark, 82
Eckles, C. H.: See Anderson, E. V.
Eckles, C. H.: See Dutcher, R. A.
Eckstein, A.: Spasmophilia, 416
Eckstein, A., and others: Lobeline on Respiratory Centre, 279
Eckstein, A., and Rominger, E.: Respiration of Suckling, 194
Eckweiler, H., and others: Ampholytic Amino-Acids, 12
Eddy, N. B.: Heart Block, 402; Spleen Secretion, 448
Eddy, N. B., and Downs, A. W.: Extensibility of Muscle, 246
Eddy, N. B.: See Downs, A. W.

Eddy, W. H., and others: Vitamins, 436; Yeast Test for Vitamin, 263
Eddy, W. H., and Stevenson, H. C.: Vitamin Measurement, 59
Edelstein, F., and Jippö, A.: Placenta Permeability, 78
Edgerton, C. W.: Tomato Ripening, 342
Edgerton, C. W., and Moreland, C. C.: Fungi and Sugar Cane, 341
Edie, E. S.: Pepsin and Rennin, 478; Tryptic Digestion, 478
Edlbacher, S.: Protein Amino Groups, 9; Protein Amino-N., 475
Edlbacher, S., and Fuchs, B.: Protein Reaction, 239
Edminster, A. F.: See Magness, J. R.
Edmunds, C. W.: Liver Volume, 591
Edridge-Green, F. W.: Red Fatigue, 362
Edson, H. A., and Shapovalov, M.: Potato Disease, 544
Edström, G.: Muscle Excitability, 414
Eeckhout, A. v. d.: Arsenic on Bones, 589
Eerland, L., and Leeuwen, W. S. v.: Adsorption by Brain, 593
Eerland, L.: See Leeuwen, W. S. v.
Effront, J.: Acclimatisation of Micro-Organisms, 161; Yeast and Arsenic, 161
Ege, R.: Glucose of Blood, 49: Glucose Exchange of Red Cells, 206; Osmotic Pressure in Red Cells, 186
Ege, R., and Henriques, V.: Acidæmia in Tetany, 382; Blood Sugar, 441
Ege, R.: See Henriques, V.
Eggerth, A. G.: Collodion Membranes, 548
Eggstein, A. A.: Alkaline Reserve in Anaphylaxis, 455, 456
Ehn, M.: See Thro, W. C.
Ehrenberg, P.: K and Ca in Plants, 228; Soil Inoculation, 104
Eichholtz, F.: Rhythmic and Tonic Reflexes, 417
Eichhorst, H.: Marrow in Chlorosis, 244
Eigenberger, F.: See Pribram, H.
Eijkman, C.: Metabolism in Tropics, 266
Einhorn, M.: Aperients and Liver, 138; Intestinal Tube, 236; Peptic Ulcer, 575; Salts on Liver, 591
Einthoven, W.: Visibility of Threads, 561
Einthoven, W., and Roos, J.: Psychogalvanic Reflex, 364
Eisenberg, P.: Disinfection, 163
Eisenhardt, W., and Schaefer, R.: Blood during Menstruation, 385
Elderton, E. M.: Finger-print Inheritance, 547
Elfving, F.: Acids formed by Aspergillus, 162
Elias, H., and Sammartino, U.: Acids and Glycosuria, 322
Elias, H., and Weiss, S.: Blood Sugar, 580
Ellett, W. B., and Harris, W. G.: Soil Experiments, 344
Ellett, W. B., and Holdaway, C. W.: Cow's Rations, 57
Ellinger, A.: Œdema and Serum Protein, 62
Ellinger, A., and Heymann, P.: Body Fluids, 483
Ellinger, A., and others: Diuresis, 593
Ellinger, P.: Colloids of C.S.Fluid, 624; Denervated Kidney, 444; Drop Counter, 237; Potassium and Cell Respiration, 624
Elliott, A. R.: Circulation Stasis, 391
Elliott, W.: See Bradley, H. C.
Ellis, F. W.: Fish Glycogen, 555
Ellis, M. M.: Circulation and Posture, 258
Ellis, N. R., and others: Vitamin, 264
Ellis, N. R.: See Hart, E. B.
Elschnig: Blood Sedimentation, 35
Embden, G.: Phosphoric Acid Estimation, 471
Embden, G., and Grafe, E.: P_2O_5 Excretion, 484
Embden, G., and Laquer, F.: Lactacidogen, 483
Embden, G., and others: Lactacidogen, 483; Work and Phosphates, 484
Emerique, L.: See Lapicque, L.
Emge, L. A.: Amnion Mitochondria, 616
Emge, L. A., and Jensen, J. P.: Benzyl Benzoate, 525
Engel: Fate of Naphthylamine, 439
Engeland, R.: Protein Amino-N, 475
Engelhardt, W.: See Stepp, W.
Engelkes, H.: Specific Oxygen Capacity, 260
Engelmann, W.: Becquerel Ray Effects, 117
Engfeldt, N. O.: Aceto-acetic Acid, 8
England, J.: Vitamins, 263
Epstein, A.: Pseudomonas polysaccharidarum, 226
Erdstein, F., and Fürth, L.: Toxin Destruction, 393
Erlanger, J.: Blood Volume, 252; Compression of Artery, 133
Ernst, Z., and Weiss, St.: Micro-Sugar Estimation, 236
Esam, G.: Fruit-Storage, 336
Esch, P.: Menstrual Therapy, 157
Euler, H.: Review, 399
Euler, H. v., and Laurin, I.: Yeast and Galactose, 459
Euler, H. v., and Myrbäck, K.: Intestinal Enzymes, 353; Vitamins, 375
Euler, H. v.: Pencillium Enzymes, 339
Euler, H. v., and others: Yeast and Galactose, 227
Euler, H. v., and Pettersson, A.: Vitamin B, 536
Euler, H. v., and Svanberg, O.: Amylase, 112, 353; Esters as Ampholytes, 350; Inactivated Saccharase, 339; Intestinal Saccharase, 353; Saccharase, 112
Evans, A. C.: Reaction and Phagocytosis, 177
Evans, C. L.: Blood Reaction, 108, 424; Blood Reaction after Hæmorrhage, 309; Heat Paralysis, 118; H-ion Concentration, 497; Hydrogen Electrode Error, 108
Evans, C. L.: See Dudley, H. W.
Evans, F. A.: See Clark, H. M.
Evans, H. M.: Poisonous Fish, 596
Everest, E. A., and Hall, A. J.: Anthocyanins, 285
Eweyk, C. v.: See Bickel, A.
Eyster, J. A. E., and Meek, W. J.: Heart Beat, 40; Sino-Auricular Node, 192
Eyster, J. A. E.: See Meek, W. J

Fabre, R.: See Pachon, V.
Fackenheim: Pupil Reaction, 236
Faes, H., and Staehelin, M.: Temperature on Cockchafers, 354
Fagiuoli, A.: See Ascoli, M.
Fåhræus, R.: Blood Sedimentation, 186
Fahrig, C.: Muscarin Fungi, 86
Faillie, R.: See Chailley-Bert, P.
Fairchild, T. E.: See Pearl, R.
Falck, R.: Morchella Cultivation, 229
Falk, I. S.: Salt Action, 92
Falk, K. G.: See Eckweiler, H.
Falkov, M.: See Raizin, G. W.
Fallada, O., and Greisenegger, J. K.: Beet Sugar, 99
Falta, W., and Richter-Quittner, M.: Blood Corpuscle Contents, 255; Cl and Clotting, 187; Oligodynamic Action, 219
Fano, C. da: Encephalitis, 157; Golgi Apparatus, 301, 555; Golgi-Cox Preparations, 109
Fano, G.: Inhibition and Volition, 123
Farmachidis, G. B.: Tonsils, 521
Farner, E., and Klinger, R.: Tetany, 70

Farrington, E. D.: See Bloor, W. R.
Fauré-Frémiet, E.: Egg Composition, 615; Lung Growth, 556; Paraffins in Tissues, 477
Fauré-Frémiet, E., and Streel, Du V. de: Tadpole and Egg, 641
Fauré-Frémiet and others: Lung, 19
Fauré-Frémiet, E.: See Dragoiu, J.
Fauré-Frémiet: See Gruzewska, Z.
Fauville, A.: Psycho-Galvanic Reflex, 127
Fawcett, H. S.: Citrus Fruit, 649
Feenstra, T. P.: Ionic Balance, 628
Feenstra, T. P.: See Jannink, E. T.
Feigl, J.: Blood Lipoids and Fats, 189; Blood Phosphorus, 39, 40; Cholesterinæmia, 5; Liver in Yellow Atrophy, 221; Non-Protein Blood N, 188
Feil, H. S., and others: Heart Studies, 314
Feissly, R.: Blood Clotting and X Rays, 567
Feldsberg, E.: See Fränkel, S.
Felix, K.: Basic Proteins, 475
Fellenberg, T. v.: Sugar Estimation, 6
Fellner, O. O.: Ovary in Pregnancy, 329; Sex Lipoids, 449
Felton, L. D.: H-Ion Determination, 237
Fenger, F.: Brain Cephalin, 550
Fenger, F., and Hull, M.: Enzymes of Pancreas, 317
Fenn, W. O.: Phagocytosis, 177, 300
Ferguson, M. I. H.: See Gribbon, M. R.
Fernandez, O.: Oxidases, 339
Fernberger, S. W.: See Burt, H. E.
Ferree, C. E., and others: Vision Testing, 30
Ferry, R. M.: See Adolph, E. F.
Fetscher, Milk Dilution, 277
Feucht, B.: Blood Counts, 109
Feuillié, E.: See Achard, C.
Feulgen, R.: Nucleic Acids, 10; Oleic Acid Hydrogenation, 474
Feulgen, R.: See Stepp, W.
Fiebiger, J.: Steinach Rejuvenation, 449
Field, A. M.: Protein Purification, 239
Fildes, L. G.: Word-Blindness, 622
Fildes, P.: Influenza Bacillus and Hb, 92
Fillon, R.: See Hinard, G.
Finckh, E. R. O.: Ions in Ringer, 500
Findlay, G. M.: Beri-Beri, 202; Glyoxalase in Beri-Beri, 264; Scurvy, 436
Findlay, L.: Diet and Rickets, 264
Findlay, L., and others: Rickets, 512
Finks, A. J., and Johns, C. O.: Nutrition Studies, 434
Finks, A. J.: See Johns, C. O.
Firket, J.: Anæmia, 594; Saponin in Platelets, 589
Fischer, A.: Fibroblasts and P_H, 554; Gastric Secretion, 53
Fischer, H.: CO_2 as Manure, 230; Suprarenals and Cramp, 147
Fischer, H., and Barrenscheen, H.: Bilirubin Azodye, 351
Fischer, H., and Luckmann, V.: Dipyrrylmethane Dyes, 350
Fischer, J. F.: Incitamin, 526
Fischer, M. H.: Visual Data, 365
Fischer, M. H.: Review, 467
Fischl, L.: Innervation of Alimentary Canal, 52
Fisher, D. F.: See Brooks, C.
Fisher, M. L.: See Dormancy, 97
Fisher, R. A.: Plant Growth, 160
Fiske, C. H.: Phosphate Estimation, 270; Sulphate by Benzidine, 381
Fitch, J. B.: See Hughes, J. S.
Fittipaldi, E. H.: Proteose in Urine, 270
Fitz, R., and Bock, A. V.: Blood Sugar, 636
Flack, M.: Respiratory Efficiency, 430
Flandin, C., and Tzanck, A.: Anaphylaxis, 644
Flatteley, F. W.: Tides, 469
Fleisch, A.: H-ion and Respiration, 503; H-ion on Blood Flow, 430
Fleischmann: Tonsils, 448
Fleischmann, O.: Cerebro-Spinal Fluid, 127; Pituitary and C.S. Fluid, 308
Fleming, A.: See Douglas, S. R.
Fleming, G. B.: Infantile Atrophy, 65
Fleming, N., and Thaysen, A. C.: Cotton Deterioration, 459
Fletcher, W. M.: Aims of Physiology, 401
Flintzer, S.: See Strohmann, H.
Florence, G.: See Hugounenq, L.
Florence, P. S.: See Ryan, N. H.
Florin, R.: Fruit Fertility, 397
Flu, P. C.: Mosquitoes and Temperature, 115
Flügel, J. C.: Auditory Fatigue, 28
Flury, F., and others: Gas Poisoning, 281
Foà, C.: Vasomotor Centre, 134; Vascular Tone, 501
Fodor, A.: Enzyme Sols, 97; Yeast Colloids, 95. See Abderhalden, E.
Foley, F. E. B.: See Cushing, H.
Folsom, D.: See Schultz, E. S.
Fonio, A.: Blood-Clotting, 187
Fontaine, J.: Blood Pressure in Horse, 133
Fontès G., and Thivolle, L.: Glucose Estimation, 378, 403
Fontes, J.: See Mira, F. de
Foot, N. C.: Endothelial Reactions, 617
Foote, J. S.: Circulation in Bone, 617
Forbes, A.: Spinal Reflexes, 359
Forbes, A., and others: Elephant Heart Records, 256
Forbes, A.: See Whitaker, L. R.
Forbes, E. B., and others: Ca Metabolism, 511
Forbes, R. H.: Copper and Crops, 396
Forman, J.: See Aub, J. C.
Forssman, J.: Anaphylaxis, 88; New Serum Sickness, 90; Wassermann Reaction, 529
Forster, M. O.: Living Organism, 469
Forsyth, J. A. C.: See Cammidge, P. J.
Fosse, R.: Cyanic Acid Formation, 240
Fosse, R., and Rouchelman, N.: Urea and Liver Autolysis, 262
Foster, D. L., and Moyle, D. M.: Cold on Muscle, 303
Foster, G. L.: See Schmidt, C. L. A.
Foster, H. E.: See Ayer, J. B.
Foster, N. B.: Uræmia, 90
Foulerton, A. G. R.: Liver Atrophy, 390
Fourneau, E., and Gonzalez, A.: Choline Separation, 613
Fowler, G. J., and others: Mahua Flower, 532
Fox, E. L.: See Benedict, F. G.
Fox, F. W.: See Gardner, J. A.
Fox, H. M.: Oxygen and Chemotropism, 176. Oxygen Use of Flagellates, 298
Franchetti, A.: See Lustig, A.
François-Franck: Obituary, 468
Frank, A.: Amyloid, 598
Frank, E., and Nothmann, M.: Drugs on Muscle, 486
Frank, E., and others: Quanidine Intoxication, 594; Muscle Tonus, 415
Frank, O.: Segment Capsules, 609
Fränkel, L., and Geller, F. C.: Pituitary and Ovary, 383
Fränkel, M.: Endocrine Connective Tissue Relations, 383
Fränkel, S., and Feldsberg, E.: Tryptic Anhydrase, 409
Fränkel, S., and Meldolesi, G.: Pressure and Enzymes, 175

Fränkel, S., and Nassau, E.: Tryptophane Tripeptide, 11
Frankenthal, K.: See Jacoby, M.
Frankl, O.: Placenta Separation, 276
Franzen, H., and others: Plant Composition, 394
Franzen, H., and Schneider, A.: Amine Separation, 476
Franzen, H., and Wagner, A.: Plant Chemistry, 223
Fraps, G. S.: Phosphate of Soil, 343
Fraser, A. D.: See Hall, I. W.
Fraser, L. McP., and others: Anoxæmia on Respiratory Centre, 196
Frazier, W. C.: See Fred, E. B.
Fred, E. B.: Nitrogen Fixation, 602
Fred, E. B., and Davenport, A.: Nitrate Organism, 540
Fred, E. B., and others: Pea Inoculation, 602
Fred, E. B., and Peterson, W. H.: Lactic Acid Ferment, 601
Fredericq, H.: Electrocardiogram Interpretation, 370; Electrocardiogram, 498
Fredericq, H., and Deschamps, A.: Bradycardia and Drugs, 313; Caffeine and Sympathetic, 331
Fredericq, H., and Terroine, E. F.: Cardiac Effects of Quinoleine, 331
Fredericq, L.: International Physiological Congress, 1; Œsophageal Record, 569; Sensation, 563
Freedman, B. P.: See Barbour, H. G.
Freedman, G. F.: Transpiration, 100
Freiburg, O.: Cell Granule Autolysis, 116
Freise, R.: Sulphur Pyrimidine Derivatives, 67
Frémiet, F., and Streel, du V. de: Tadpole and Eggs, 587
Freudenberg, E., and György, P.: Ca Fixation by Tissues, 21; Calcium of Tissues, 179; Ca of Cartilage, 357; Ca of Tissues, 482; O_2 Respiration and Vitamins, 58
Freudenberg, E., and Mammele, H.: Epithelium Respiration, 61
Freudenberg, K.: Cellulose, 337
Freund, H.: Cell-Products in Blood, 571; Defibrinated Blood, 84; Protein Metabolism and Heat Production, 69
Freund, H., and Gottlieb, R.: Cell Products, 218
Freund, H. A., and Lockwood, B. C.: Osteomalacia, 74
Frey, E.: Frog Heart Tetanus, 22; Hellebore, 628; Spleen and Blood Destruction, 33; Strychnine on Heart, 42
Frey, M. v.: Space Sensation, 493
Fricke, R.: Acetaldehyde, etc., in Urine, 516
Fricke, R.: See Stepp, W.
Frieboes, W.: Biology of Skin, 325
Friedberg, E.: Caffeine Excretion, 389; Properties of Tendon, 301; Vegetative Nervous System, 218, 280
Friedenwald, J., and Sindler, J.: Duodenal Contents, 575
Friedman, G. A.: Graves' Disease and Myxœdema, 147
Friedman, G. A., and Gottesman, J.: Thyroid and Pancreas, 520
Friedrich, L. v.: Gastric Acidity, 574
Fries, J. A.: Respiratory Quotient, 135
Fries, J. A.: See Armsby, H. P.
Friese, E.: Bile-Duct Occlusion, 198
Frisch, A., and Starlinger, W.: Protoplasma Activation, 481
Frisch, K. v.: Salamander Coloration, 325
Fritz, M.: See Voigt, J.
Fry, W. H.: See Moore, C. J.
Froeberg, S.: Cigar Smoking, 30
Fröhlich, A., and Grossmann, M.: Camphor in Fibrillation, 312
Fröhlich, A., and Kreidl, A.: Heat Narcosis, 116; Light on Crabs, 116
Fröhlich, A., and Meyer, H. H.: Muscle Tonus, 24
Frolich, T.: See Holst, A.
Fromm, S.: Phloridzin Glycosuria, 50
Fröschels, E.: Child Voices, 2
Frowein, B.: Thyroid and Myxœdema, 519
Fuchs, B.: Arginase, 241
Fuchs, B.: See Edlbacher, S.
Fuchs, F.: Humic Acid, 223
Fühner, H.: Benzine Hydrocarbons, 217; Narcotics, 452; Synergism of Drugs, 85
Fühner, H., and Mertens, E.: Cytisine, 219
Fuhrmann, L.: Blood of New-Born, 496
Fujii, I.: Glycæmia, 379; Ether Glycosuria, 580
Fujimori, Y.: See Launoy, L.
Fujimura, G.: Placenta and Decidua, 585
Fukuzawa, A.: See Kawase, S.
Fulmer, E. I.: See Nelson, V. E.
Fulton, J. F.: Ascidian Blood, 479; Cocaine on Muscle, 483; Metamorphosis, 107; Symbiosis in Actinia, 298
Funaro, A., and Musante, L.: Lupines as Food, 632
Fulmek, L., and Stift, A.: Potato Diseases, 233
Funcke, Y.: Uric Acid Estimation, 471
Funcoka, S.: Sodium Distribution, 553
Funk, C., and Dubin, H. E.: Vitamin for Rats, 59 Vitamin Test, 59
Fürth, L.: See Erdstein, F.
Fürth, O. v.: Muscle Contraction Theory, 180
Fürth, O., and Lieben, F.: Tryptophane, 476, 507
Furukawa, S.: Taste and Constitution, 250
Fussell, M. H., and Jonas, L.: Clinical Calorimetry, 141
Fyson, P. F., and Venkataraman, K.: Stem Curvature, 98

G. T.: Nobel Prize, 45
Gabathuler, A.: Milk Digestion, 61
Gabbe, E.: Blood Lipoid, 568
Gad Andresen, K. L.: Urea Distribution, 496
Gailey, W. R.: See Langdon, S. C.
Galavielle, and others: Salkowski Reactions, 238
Galeotti, G.: Muscle Metabolism, 357
Galeotti, G.: Obituary, 400
Galigher, A. E.: KCN on Respiration, 615
Galigher, A. E.: See Hyman, L. H.
Galippe, V., and Souffland, G.: Life in Rocks, 293
Garber, R. J.: Rust Resistance, 605
Gardiner, J. S.: B. A. Address, 1
Gardner, J. A.: Sterols of Fæces, 296
Gardner, J. A., and Fox, F. W.: Cholesterol Estimation, 406: Cholesterol History, 611
Gardner, J. A., and Williams, M.: Cholesterol, 405
Gardner, V. R.: Bud Selection, 102
Gardner, V. R.: See Magness, J. R.
Gardner, W.: Capillary Potential, 345; Water Transmission, 344
Gardner, W., and Widtsoe, J. A.: Soil Moisture, 345
Garner, W. W., and Allard, H. A.: Flowering and Light, 649; Plant Reproduction, 542
Garrelon, L., and Santenoise, D.: Peptone Shock, 643
Garrelon, L., and others: Chloroform Shock, 628
Garrey, W. E.: Heliotropism, 17; Respiration of Ganglion, 615
Garvie, A.: Pupil Reflex, 621
Gasser, H. S., and Newcomer, H. S.: Phrenic Currents, 488
Gassul, R.: Ultra-Violet Light, 80

Gatenby, J. B.: Golgi Apparatus, 301; Nucleolus, 19
Gatenby, J. B., and Woodger, J. H.: Germ Cells, 243
Gatenby, J. B.: See Lee, A. B.: Review, 400
Gatenby, J. B.: See Ludford, R. J.
Gates, F. L.: Collodion Sacs, 109, 599; Mechanical Pipette, 109
Gatscher, S.: See Kreidl, A.
Gauss, H.: Morphia and Alkali Reserve, 153
Gautier, R.: See Stern, L.
Gautrelet, J.: Peptone Injections, 643
Gayda, T.: Calorimetry, 636; Differential Calorimetry, 440; Heat Production of Frog, 578
G. C. G.: Potato, 601
Gedda, E.: Rabbit Thymus, 583
Geers, J.: Coagulation Time, 367
Geertruyden, M. Van.: See Zunz, E.
Geigel, R.: Heart Hypertrophy, 570; Residual and Reserve Air, 259
Geiling, E. M. K., and Green, H. H.: Blood Regeneration, 310
Geilmann, Titanium in Soil, 599
Gelderen, C. v.: Intercostal Muscles, 245; Paraffin Injections, 244
Gelei, J.: Oögenesis, 616
Gelera, M.: Blood Coagulation, 497
Geller, F. C.: See Fränkel, L.
Gellhorn, E.: Fatigue, 364; Spatial Judgments, 419; Spermatozoa, 149
Gellhorn, E.: See Abderhalden, E.
Gelpke, H.: Gold and Pt as Poisons, 314
Gentili, A.: Pituitary in Pregnancy, 148, 327
George, J. M.: See Crawford, A. C.
Georgi, F.: Psycho-Galvanic Phenomenon, 305
Geppert, F.: Blood Sedimentation, 254
Gérard, P.: See Carnot, P.
Gerhartz, H.: Venous Pulse, 570
Gerlach: Manure, 602
Gernez, C.: See Duhot, E.
Gerould, J. H.: Caterpillars, 553
Gersdorf, C. E. F.: See Johns, C. O.
Gertz, H.: Eye Movements, 306
Gertz, O.; Haustoria of *Cuscuta*, 232
Ghirlanda, C.: Tannin of Morus, 95
Giaja, J.: Alcoholic Fermentation, 95
Giaja, J., and Djermanovitch, M.: Yeast, 225
Gianelli, S. A.: See Levine, V. E.
Gianturco, G.: See Viale, G.
Gibbons, M.: See Little, C. C.
Gibson, C. A., and others: Autolysis of Brain, 418
Gickelhorn, J.: Euglenaciæ, 224
Giersberg, H.: Bird's Egg Shell, 587
Gies, W. J., and others: Effect of Tobacco, 387
Giese, G.: See Kossel, A.
Giessen, P. D.: See Zilva, S. S.
Giffin, H. Z., and Szlapka, T. L.: Anæmia in Splenectomy, 89
Gilbert, N. C., and Greene, C. W.: Anoxæmia, 372
Gilbert, N. C.: See Greene, C. W.
Gildemeister, M.: Gas Poisoning, 281
Gilder, M. D. D.: See Feil, H. S.
Gile, P. L., and Carrero, J. O.: Lime Chlorosis, 398
Gillis, C. L.: See Jackson, R. F.
Gillis, J.: Starch Grains, 351
Giusti, L., and Houssay, B. A.: Vagotomy in Guinea-Pig, 315
Givens, M. H., and Macy, I. G.: Dried Fruit Juice, 203
Givens, M. H., and McClugage, H. B.: Vitamins, 265
Givens, M. H., and others: Vitamins, 265
Glaser, R. W.: See Brues, C. T.
Glaus, A.: Heart Acceleration, 41
Gley, E., and Pézard, A.: Castration, 587
Gley, E., and Quinquaud, A.: Reflex Salivation, 260; Splanchnic and Suprarenal, 520; Splanchnic Excitation, 630
Gloahec, P. Le.: See Lenoble, E.
Godfrey, M. J.: Fertilisation of Ophrys, 542
Goebel, W.: See Trendelenburg, P.
Goeckel, H. J.: Creatinine and Acetone Estimation, 270
Goeke, H.: Diabetes Insipidus, 73
Goldblatt, H.: See Ecker, E. E.
Goldblatt, H.: See Rogoff, J. M.
Golding, J.: See Drummond, J. C.
Golding, J.: See Zilva, S. S.
Goldman, A.: See Mudd, S.
Goldmark, J., and Hopkins, M. D.: Industrial Fatigue, 1
Goldschmidt, M.: Corneal Diffusion, 83
Goldschmidt, R.: Cytology of Sex Cells, 19; Sex Determination, 450
Goldschmidt, S.: Intestinal Absorption, 506
Goldsmith, M.: Phototropism, 615
Golla, F. L.: Neurosis, 349
Gonzalez, A.: See Fourneau, E.
Goodpasture, E. W.: Hyperthyroidism, 382; Thyroid and Heart, 519
Goodson, J. A.: Zanthoxylum Bark, 286
Gorder, L. V.: See Todd, T. W.
Gordon, H.: Left-Handedness, 185
Gordon, J. W.: Venipuncture in New-Born, 629
Gore, H. C., and Mangels, C. E.: Vegetable Storage, 604
Gorham, F. D.: Gastric Acidity, 261
Gorini, C.: Bacterial Mutation, 460
Gorke, H.: See Seeliger, S.
Gorter, K.: Lycorine, 532
Gortner, R. A.: See Harris, J. A.
Gortner, R. A.: See Holm, G. E.
Gosset, A., and others: White Bile, 506
Goto, K., and Kuno, N.: Renal Sugar Threshold, 142
Gottfried, A.: See Kappeller, G.
Gottesman, J.: See Friedman, G. A.
Gottlieb, R.: See Freund, H.
Gottlieb-Billroth, H.: See Meyer, K. H.
Gottschalk, A.: Nerve Asphyxia, 304
Gottschalk, A.: See Lipschitz, W.
Govaerts, P.: Agglutination of Particles, 393; Antiplatelet Serum, 529; C.S. Fluid Clothing, 564; Platelets, 129; Platelets and Bacteria, 566
Govaerts, P.: See Zunz, E.
Gow, A. E.: Peptone in Septicæmia, 93
Goy, P.: Plant Growth, 538
Grab, M. v.: Pyruvic Acid in Fermentation, 613, 646
Grabfield, G. P., and Squier, T. L.: X Rays and Suprarenal, 147
Grabham, M. C.: Subtropical Esculents, 633
Gradinescu, A.: Bryonia, Action on Heart, 643
Gradle, H. S.: Blind Spot, 562
Grafe, E.: See Embden, G.
Grafe, V.: Plant Stimulation, 232
Graham, G.: Glycæmia and Glycosuria, 268
Graham-Smith, G. S.: Bacterial Growth, 230
Gralka, R.: See Aron, H.
Gralka, R.: See Bossert, O.
Gram, H. C.: Blood Fibrin, 566; Blood Sedimentation, 495; Red Corpuscle Volume and Hb, 308
Grandori, R.: Silkworm Egg Development, 300
Grant, S. B.: See Mudd, S.
Gratia, A.: Autolysis of Staphylococcus, 335
Gray, H., and Root, H. F.: Body Length, 266
Gray, J.: Cell Exosmosis, 554; Ciliary Motion, 355
Greaves, J. E.: Salts on Plants, 338
Greaves, J. E., and Carter, E. G.: Soil Bacteria, 345

Green, H. H.: Osteophagia, 222
Green, H. H.: See Geiling, E. M. K.
Greenberg, P.: See Underhill, F. P.
Greene, C. H.: See Kramer, B.
Greene, C. W.: Carbohydrate of Salmon, 641; Salmon Ovaries, 586
Greene, C. W., and Gilbert, N. C.: Electrogram in Anoxæmia, 427; Heart in Anoxæmia, 431; Oxygen Want, 192
Greene, C. W.: See Gilbert, N. C.
Greenish, H. G., and Pearson, C. E.: Santonin, 223
Greenthal, R. M., and O'Donnell, W. S.: Red Cell Fragility, 625
Greenwald, I.: Alkalosis and Tetany, 453
Greenwood, W. O.: Artificial Respiration in New-Born, 259
Grego, R.: Bile Salts, 137
Greguss, P.: Abscission and Transpiration, 164
Greisenegger, J. K.: Beet, 99; Plant Lighting, 103; Spacing of Beet, 103
Greisenegger, J. K., and Vorbuchner, K.: Root Excretion, 100
Greisenegger, J. K.: See Fallada, O.
Greisheimer, E., and Shepard, C. E.: $MgCl_2$ on Nerve, 182
Grenet, H., and others: Leucocyte Reactions, 129
Greving, R.: Sympathetic Ganglion, 489
Grey, E. C., and Young, E. G.: Bacterial Enzymes, 286
Gribbon, M. R., and Ferguson, M. I. H.: Food in Vienna, 139
Gribbon, M. R., and others: Nutrition in Vienna, 511
Griffith, J. J.: Liming, 464; Liming Soil, 601
Grigaut, A., and Thiery, J.: Kjeldahl Method, 237
Grigaut: See Chauffard
Grimmer, W., and Wiemann, B.: Chemistry of Bacteria, 339
Grindley, H. S.: See Hamilton, T. S.
Groebbels, F.: Bird Brain, 183; C.N.S. Structure, 123
Gröbly, W.: Blood P and Carcinoma, 283: Nucleoprotein Metabolism, 243
Grönberg, J.: Abderhalden Reaction, 93; Blood Ferments, 551
Groot, J. T.: See Cooper, A. R.
Gross, A. O.: Feeding of Nereis, 114
Gross, E. G., and Steenbock, H.: Creatinuria, 205, 378
Gross, R. E.: Arginase Dynamics, 112
Grossman, M.: See Frohlich, A.
Grounds, G. L.: See Noyes, H. A.
Gruber, C. M.: Adrenaline and Auricles, 154
Grulee, C. G., and Bonar, B.E.: Egg White Precipitins, 518
Grünbaum, A. A.: Psychogalvanic Reflex, 30; Psychology of Reaction, 365
Grünhut, L.: Lævulinic Acid, 507
Grünhut, L., and Weber, J.: Amino-Acids and Sugars, 473
Grutzner, R.: See Strauss, E.
Gruzewska, L., and Fauré-Frémiet: Liver Glycogen, 440
Grynfeltt, E., and others: Porphyrinuria, 517
Grynfeltt, E., and Lafont, R.: Sulphonal Poisoning, 413
Gudernatsch, J. F., and Bagg, H. J.: Radium on Embryos, 79
Gudzent: Gout, 90
Guedel, A. E.: Ethyl Chloride, 451
Guenther, A. E.: See Peters, A. W.
Guerchio, V.: Phenolipoids, 279
Guerrero, L. E.: See Monserrat, C.
Guest, G. M.: See Mills, C. A.
Guglielmetti, J., and Pacella, G.: Curari Action, 358; Curari on Frogs, 248
Guglielmetti, J.: See Arrillaga, F.
Guillaumin, C. O.: Sugar Estimation, 471
Guilliermond, A.: Cytology of Fungi, 94; Mitochondria, 158, 222; Plant Mitochondria, 530
Gulbransen, R.: See Browning, C. H.
Gullichsen, R., and Soisalon-Soininen, J. L.: Metabolism in Wrestling and Fencing, 431
Gundlach, R.: See Hess, W. R.
Gundlach, R.: See Rothlin, E.
Gunn, J. A., and Davies, D. S.: Vagina Innervation, 215
Gunn, J. A., and Heathcote, R. St. A.: Immunity, 87; Squill Toxicity, 218
Gunn, J. W. C.: Emmenagogue Oils, 155; Respiration Pump, 170
Gunnar, H.: See Becht, F. C.
Günther, H.: Myoglobin, 476
Günzburg, L.: Lactacidogen, 484
Gurwitsch, A.: Plant Cell Division, 396
Gutherz, S.: Sarcoplasm Theory, 120
Guthrie, C. C.: Gas Analysis Methods, 609
Guthrie, F. B.: Analysis of Saltbush, 224
Guttenberg, H. v.: Statocysts in Geotropism, 101
Guttman, A.: Colour Blindness, 307
Guy, R. A.: Infant Blood Sugar, 580; Benedict's Sugar Method, 610
Gwathmey, J. T.: Colonic Anæsthesia, 80; Anæsthetics, 451
György, P.: Sedimentation of Corpuscles, 186; Vitamins and Cell Respiration, 319
György P.: See Freudenberg, E.
György, P.: See Rona, P.
Györgyi: See Szent-Györgyi.

Haag, J. R.: See McCall, A. G.
Haan, J. de, and Creveld, S. v.: Aqueous Humour and Plasma, 623
Haar, A. W. v. d.: Mn in Oxidases, 395
Haas, P.: Carrageen, 458
Haas, P., and Hill, T. G.: Carrageen, 158
Habein, H. C.: See Hoffman, M. H.
Haberlandt, G.: Cell Division, 222; Plant Wounds, 284
Haberlandt, L.: Cardiac Vagus, 40, 313; Sterility, 640; Vagus Functions, 499
Häberlin, C., and Müller, F.: Metabolism at Seaside, 141
Hachen, D. S., and Isaacs, R.: Alkali Reserve in Influenza, 93
Hadjopoulos, L. G.: See Kahn, M.
Haehn, H.: Tyrosinase, 409
Haessler, H.: See McMaster, P. D.
Haffner, F.: See Jodlbauer, A.
Hagemann, E.: See Bürger, M.
Hagem, O.: Thermotropism, 232
Haggard, H. W.: CO on Heart, 431; Effect of Petrol, 151; Estimation of CO, 48
Haggard, H. W., and Henderson, Y.: Blood Equilibria, 46; CO Asphyxia, 431; CO Poisoning, 526
Haggard, H. W.: See Henderson, Y.
Hahn, A.: Diastases, 113, 225; Double Nitrogen, 513; Urease, 225
Hahn, A., and Barkan, G.: Creatine and Creatinine, 5
Hahn, A., and Harpuder, K.: Salts on Diastases, 226
Hahn, A., and Michalik, R.: Salts on Diastases, 112
Hahn, A.: See Barkan, G.

Hahn, A.: See Broemser, P.
Hajós, K.: See Karczag, L.
Halban, J.: Sex Characters, 523; Sexual Hormones, 449
Haldane, J. B. S.: Blood Alkalinity, 424
Haldane, J. B. S.: See Bazett, H. C.
Haldane, J. S.: See Dautrebande, L.
Haldane, J. S.: Respiration and Kidney, 107
Hall, A. R.: Worm Nerve Regeneration, 242
Hall, A. J.: See Everest, E. A.
Hall, I. W., and Fraser, A. D.: Staphylococci, 540
Hall, M. W.: Blood after Splenectomy, 367
Halliburton, W. D.: Infinitely Little, 107, 293; Vitamins and Common Sense, 139
Hallion, L.: Suprarenal Vasomotor Response, 382
Hallisey, J. E.: See Buckman, T. E.
Halpert, A.: Capillaries in Raynaud's Disease, 37
Halstead, C. E.: See Meier, H. F. A.
Halverson, J. O.: See Forbes, E. B.
Hamburger, F., and Jellenigg, K.: Body Weight, 65
Hamburger, H. J.: Blood Cell Volume, 402; Microvolumetric Analysis, 402; Permeability, 547
Hamburger, R.: See Zerner, E.
Hamburger, W. W.: See Hewlett, A. W.
Hamill, P.: Pituitary Extract Feeding, 327
Hamilton, H. C.: Hæmostatic Agents, 332
Hamilton, T. S., and others: Amino-Acids of Feeds, 610
Hammar, J. A.: Thymus, 583
Hammarsten, O. D., and Runnström, J.: Priapulus, 115
Hammett, F. S.: Creatine and Tonus, 120; Endocrines and Tumours, 213; Intestine Reactions, 198; Muscle Creatinine, 557; Nervous System and Parathyroids, 211; Thyroid and C.N.S., 271; Thyroid and Creatinine, 583; Thyroxin, 446
Hammett, F. S., and Nowrey, J. E.: Germanium Dioxide, 643
Hammett, F. S., and Tokuda, K.: Thyroid Extract, 446
Hamous, J.: Sugar Beet, 601
Hanàk, A.: Capillary Filtration, 371; Muscle Currents, 557
Handovsky, H.: Ionic Antagonisms, 110; Hæmolytic Poisons, 526
Handovsky, H.: See Abderhalden, E.
Hanke, M. C. E.: See Riddle, O.
Hankin, E. H., and Hartridge, H.: Stereoscopy, 184
Hannaelt, L., and Wodon, R.: N Estimation, 239
Hannemann, E.: Keratitis, 20
Hannevart, G.: Plant Vacuoles, 459
Hannevart, G.: See Philippson, M.
Hannes, B.: Ileo-cæcal Valve, 54
Hannum, E.: See Huntoon, F. M.
Hansen, K.: Heart and Ca, 314; Pressure Sense, 307
Hansen, O. S.: $MgSO_4$ in As Poisoning, 282
Hansen, R.: See Lohms, F.
Hansen, R.: See Whiting, A. L.
Hanzlik, P. J.: Alkaloids on Heart, 590; Amines, 387; Chelidonium, 82; Chelidonin, 592; Hæmostatic Serum, 36; Salicylates, 525; Salicylic Acid from Salicylates, 388
Hanzlik, P. J., and Irvine, A.: Thioureas, 526
Haoi, C.: Hæmolysin in Cerebro-Spinal Fluid, 493
Hara, M.: Nephritis, 517
Harden, A.: Vitamins, 507
Harden, A., and Henley, F. R.: Acetaldehyde in Fermentation, 287; Alcoholic Fermentation, 339
Harden, A., and Robison, R.: Fruit Juice, 510
Harden, A., and Zilva, S. S.: Yeast Vitamins, 460
Harder, R.: Plant Light Reactions, 461
Harding, V. J.: Nausea and Vomiting, 450
Harding, W. G.: Cellulose, 337
Hargood-Ash, D.: See Campbell, J. A.
Hári, P.: Hæmoglobin, 187; Hibernation and R. Q., 206; Urine Reaction, 324
Harlan, H. V.: Barley, 541
Harlan, H. V., and Anthony, S.: Barley, 541
Harlan, H. V.: See Anthony, S.
Harlé, H.: Sphygmometer Curves, 132
Harms, W.: Intranephridial Organs, 16
Harpuder, K.: See Hahn, A.
Harris, D. F.: Cerebellum, 362; Coloured Thinking, 31
Harris, D. T.: Blood-Gas Apparatus, 170
Harris, F. S.: Utah Agriculture, 530
Harris, F. S., and Butt, N. I.: Utah Agriculture, 530
Harris, F. S., and Maugham, H. J.: Moisture and Wheat, 230; Depth of Sowing, 288
Harris, I.: Digitalis and Atropine, 279
Harris, J. A.: Size and Growth, 65
Harris, J. A., and Benedict, F. G.: Basal Metabolism, 203
Harris, J. A., and others: Osmosis and Plants, 231; Plant Sap, 541; Plant Tissue Properties, 158; Plant Tissue Fluids, 341
Harris, J. A., and Reed, H. S.: Plant Growth, 396
Harris, J. A., and Scofield, C. S.: Experimental Plots, 397
Harris, J. A., and Valentine, A. T.: Plant Conductivity, 604
Harris, W. G.: See Ellett, W. B.
Harrison, A. P.: Nitrate Reduction, 172
Harrison, G. A.: Albuminuria, 598
Harrison, R. G.: Amblystoma Lens, 26; Amphibian Gills, 631
Harrop, G. A.: See Krogh, A.
Harst, J. C. v. d.: Sugar in Urine, 471
Hart, C.: Endocrine Organs, 383
Hart, D.: See Curtman, L. J.
Hart, E. B., and others: Ca Assimilation, 58, 510; Milk Powders, 264; Milk Production, 588
Hart, E. B.: See Ellis, N. R.
Hart, E. B.: See Steenbock, H.
Hart, E. B.: See Tottingham, W. E.
Hart, J. W.: Blood Sampling, 4
Hart, M. C.: See Hirschfelder, A. D.
Hartleben, H.: Adsorption by Charcoal, 173
Hartman, A. F.: See Shaffer, P. A.
Hartman, C. G.: Opossum Mamma, 216
Hartman, F. A., and Blatz, W. E.: Denervated Muscle, 180
Hartmann, A.: X Rays on Tadpoles, 309
Hartmann, C.: See Weitz, W.
Hartree, W., and Hill, A. V.: Isometric Twitch, 558; Muscle Energy, 118; Muscle Resistence, 415; Muscular Contraction, 302
Hartridge, H.: Audition, 562; Hb Spectrum, 111; Resonance Theory, 184, 250
Hartridge, H.: See Hankin, E. H.
Hartwell, B. L., and Damon, S. C.: K and Na for Plants, 163
Hartwell, B. L., and others: Crop Rotation, 163
Hartwell, B. L., and Pember, F. R.: Silicates and Soil, 343
Hartwell, G. A.: Diet and Milk, 277, 318; Protein and Mammary Secretion, 642
Hartwig, L., and Saar, R.: Detection of Lactic Acid, 238
Harvey, R. B.: See Wright, R. C.
Harvey, W. F.: Blood Count and Hb, 33
Hasenbaümer, J.: Soil Reaction, 606
Haselhorst, G.: Bilirubin in Serum, 130
Hashimoto, H.: Heart in Hyperthyroidism, 583

Haskell, C. C.: See Rucker, M. P.
Hassan, K. H.: See Fowler, G. J.
Hastings, A. B.: H Electrode Vessel, 237; Lactic Acid of Blood, 487
Hastings, A. B., and Murray, H. A.: Parathyroidectomy, 212
Hastings, A. B., and others: Anæmia of Medulla, 502; Pyloric Obstruction, 197
Hatcher, R. A.: See Weiss, S.
Hatlehol, R.: See Höst, H. F.
Hatschek, E.: Viscosity of Corpuscle Suspension, 33
Hattori, K.: Lipoids as Colloids, 423
Hauenstein, J.: Radium Treatment, 386
Haurowitz, F.: Fats of Gonads, 15
Hausknecht, R.: See Blum, L.
Häussler, E. P.: Vitamins, 139
Hawk, P. B., and others: Vitamins of Honey, 59, 202; Yeast Bread, 140; Yeast in Bread, 263; Yeast-Milk Diet, 319
Hawk, P. B.: See Lermann, W. W.
Hawk, P. B.: See Rehfuss, M. E.
Hawkins, L. A., and Magness, J. R.: Fruit Storage, 397
Haworth, W. N., and Hirst, E. L.: Cellobiose, 8
Hayakawa, K., and Kuno, N.: Brain Perfusion, 491
Hayami, T.: Interstitial Cells and Pituitary, 75
Hayashi, I.: See Sakagachi, K.
Haynes, D.: Salt Effect on Buffers, 413
Head, H.: Aphasia, 169; Release of Function, 249
Heathcote, R. St. A.: Caffeine Derivatives on Heart, 154
Heathcote, R. St. A.: See Gunn, J. A.
Hecht, P.: Atropin on Stomach, 454
Hecht, S.: Dark Adaptation, 621, Light Effects, 363; Photosensory Stimulation, 16; Visual Purple, 27
Hedin, S. G.: Proteolytic Enzymes of Urine, 145
Hedinger, E.: Nerve Regeneration, 559
Heesch, K.: Colloid Reversal, 481
Hefnawi, M. T.: Lubia Rust, 607
Heft, H. L.: See Eddy, W. H.
Heiduschka, A., and Steinruck, A.: Horse Fat, 550
Heilbron, I. M.: See Baly, E. C. C.
Heilbronn, A.: Light Perception in Plants, 231
Heilbrunn, L. V.: Effects of Anæsthetics, 18; Mitosis and Viscosity, 553
Heinekamp, W. J. R.: Adrenalin and Chloroform, 72
Heinricher, E.: Mistletoe, 465
Heitzmann, O.: Gas Poisoning, 281
Hektoen, L.: Bence-Jones Proteinuria, 209; Lens Precipitins, 357
Helbig: See Siefert.
Heller, L.: Blood Clotting, 625
Hellman, T. J.: Tongue Papillæ, 556
Helvestine, F.: Amitosis, 552
Hemmi, T.: Growth of Fungi, 229; Sugar of Lotus, 338
Henderson, E. E.: See Clarke, R. H.: Review, 105
Henderson, L. J.: Blood Equilibria, 259
Henderson, L. J.: See McLean, F. C.
Henderson, Y.: Aviation Physiology, 49
Henderson, Y., and Haggard, H. W.: Effect of O_2 on Blood CO_2, 47
Henderson, Y., and others: Acapnia, 431
Henderson, Y.: See Haggard, H. W.
Hendrick, J.: Rhizomes as Food, 200; Bracken Rhizome, 394
Hendricks, E. M.: See Tashiro, S.
Hendrix, B. M., and Crouter, C. Y.: Alkali Reserve and Glycosuria, 50
Hendry, M. F.: See Benedict, F. G.
Henley, F. R.: See Harden, A.
Henneberg, W.: See Windisch, W.
Hennes: See Michiels
Henrici, M.: Photosynthesis, 603
Henrikson, P. B.: Nerve Cultures, 304
Henriques, V., and Ege, R.: Blood Glucose, 441
Henriques, V.: See Ege, R.
Hensen, V.: Heredity, 236
Hepburn, J. S.: Turkey Fat, 179
Hepburn, J. S., and St. John, E. Q.: Egg Glucose, 200
Herbst, H.: Adsorption by Charcoal, 173, 350
Hering, H. E.: Origination of Heart-Beat, 131
Herissey, H.: Mannoside Hydrolysis, 534
Herman, M.: Ambard Constant, 518
Hermann, B.: Chitose, 173
Hermanns, L., and Sachs, P.: Diazo-Reaction, 518
Herrick, C. J.: Cerebrum Development, 24
Herring, P. T.: Sensations, 491; Thyroid and Pituitary, 72; Thyroid and Suprarenals, 70
Herrington, D.: See Sayers, R. R.
Herrmann, G. R.: See Feil, H. S.
Herrmann, J. B.: See Barbour, H. C.
Herrmann, L.: See Biltz, H.
Herrnheiser, G.: See Pribram, H.
Herter, K.: Labyrinth, 419
Hertwig, G.: Chromatin in Crossings, 150
Hertwig, G.: See Lipschitz, W.
Herwerden, M. A. van: Class Work on Daphnia, 16; Platelet Count, 170
Herzberg, K.: Lactose Tests, 444
Herzfeld, E., and Klinger, R.: Muscle Contraction, 21; Defence Ferments, 175
Herzfeld, E.: See Baur, E.
Herzig, J.: N-Methyl Derivatives, 613
Herzig, J., and Lieb, H.: Desaminoproteins, 612
Herzog, M.: Enzyme Nature, 112
Herzog, R. O., and Beck, F.: Cellulose Solubility, 8
Herzog, R. O., and Becker, K.: Crystallisation, 110
Hess, A. F.: Nutritional Disorders, 107
Hess, A. F.: Review, 106
Hess, A. F., and others: Fodder and Milk Vitamins, 60, 61; Rat Rickets, 436, 509
Hess, A. F., and Unger, L. J.: Infant Diet and Rickets, 57; Rickets and Light, 510; Vitamin Oxidation, 265
Hess, A. F.: See Pappenheimer, A. M.
Hess C. v.: Colour Sense of Bees, 15; Pigment Cell Reactions, 479; Red-Green Blindness, 124; Ultra-Violet on Articulata, 114
Hess, K.: Cellulose, 8
Hess, K., and Messner, E.: Cellulose, 337
Hess, L., and Reitler, R.: Metals on Sera, 609
Hess, O.: Adrenaline Injections, 583
Hess, W. R.: Internal Friction in Gels, 110; Viscosity of Suspensions, 110
Hess, W. R., and Gundlach, R.: Adrenaline and Gastric Secretion, 148; Pituitrin and Gastric Secretion, 148
Hess, W. R., and Takahashi, N.: Vitamins, 509
Hesser, C., and Troell, A.: Cerebellar Localisation, 560
Hetényi, G.: See Rusznyák, S.
Hett, J.: Nicotine on Heart, 42
Heubner, W.: Gas Poisoning, 281
Heubner, W., and Meyer-Bisch, R.: Sulphates, 496
Heubner, W.: See Meyer-Bisch, R.
Hewer, C. L.: See Wallis, R. L. M.
Hewer, E. E.: See Cullis, W. C.
Hewitt, J. A., and Souza, D. H. de: Inositol on Heart, 131
Hewitt, J. A.: See Souza, D. H. de

Hewlett, A. W., and others: Quinidine in Fibrillation, 628
Heyd, C. G.: Cholecystogastrostomy, 434
Heyde, H. C. v. d.: Blood and Urine in Hibernation, 209; Atropine Immunity, 527; Frog Urine and Blood, 321
Heyde, H. C. van der, and Morgantown, W. M.: Vividiffusion, 402
Heyer, G. R.: Gastric Psychic Secretion, 575; Gastric Secretion, 432; Psychic Gastric Juice, 493
Heymann, P.: Reaction on Bloodvessels, 430
Heymann, P.: See Ellinger, A.
Heymans, C.: Allyltheobromine Diuresis, 332; Anæsthetics on Respiration, 371; Castration and Metabolism, 503; Diuresis by Allyltheobromine, 388; Heart Anaphylaxis, 429; Portal Blood, 506
Heymans, C., and Maigre, E.: Methylene Blue on Heart, 313; Methylene Blue Effects, 390
Heyninx, A.: Olfaction Theory, 364
Hibbard, P. L.: Sulphur for Soil, 543
Hibbert, H.: Cellulose Composition, 600
Hibma, A. M.: Protein Reaction, 270
Hickman, C. W.: See Neidig, R. E.
Higashihara, K.: See Kiyono, K.
Higgins, J. A.: See Nielsen, C.
Higginson, C. G.: Sapræmic Glycosuria, 143
Higley, E. T.: See Buchanan, J. A.
Hildebrandt, F.: Adrenalin Diabetes, 51; Sugar Threshold and Vagus, 442; Thyroid and Heat Regulation, 519
Hill, A. V.: Energy of Muscle and Nerve, 247; Hot Wire Methods, 548; Hot Wire Sphygmograph, 132; Nerve Temperature Coefficient, 181; Oxyhæmoglobin Dissociation, 630; Physical Methods, 349; Physics and Biology, 235; Voluntary Tetanus, 302
Hill, A. V.: See Brown, W. E. L.
Hill, A. V.: See Hartree, W.
Hill, L.: Bat's Wing Vessels, 133; Capillary Pressure, 193, 314; Local Thermal Applications, 134; Kidney Capillary Pressure, 259; Plant Growth in Wind, 102; Oxygen Bed Tent, 330
Hill, L., and Campbell, J. A. C.: Muscular Work, 266
Hill, L., and McQueen, J. M.: Capillary Pressure, 45, 134, 371; Glomerular Filtration, 516
Hill, L.: See Campbell, J. A.
Hill, L.: See Dale, H. H.
Hill, L.: See Douglas, S. R.
Hill, R. M.: See Lewis, H. B.
Hill, T. G.: See Haas, P.
Hiltner, L., and Lang, F.: Manures and Crops, 163
Himmelreich, A.: Adiposity, 73
Hinard, G., and Fillon, R.: Starfish, 614
Hindmarsh, J. H.: Anoxæmia on Heart, 369
Hirai, K.: Dioxyphenylalanine, 224; Tyroxine Derivatives, 226
Hiramatsu, T.: Heart in Exertion, 498
Hirosawa, M.: See Inouye, R.
Hirose, K.: Bulbospinal Path, 249; Restiform Nucleus, 249, 560
Hirose, T.: Corpus Luteum, 77, 523
Hirsch, E. F.: Alkali Reserve in Infection, 93; Blood in Infections, 392; Rigor in Plain Muscle, 22
Hirsch, J.: Acetaldehyde in Sugar Metabolism, 316
Hirsch, J.: See Neuberg, C.
Hirsch, P., and Löwe, F.: Defensive Ferments, 225
Hirschfelder, A. D., and others: Mercury Saligenin, 152; Saligenin Hg Compound, 389
Hirschfelder, A. D.: See Quigley, J. P.
Hirst, E. L.: See Haworth, W. N.
Hiruma, K.: Blood Sugar, 515
Hitzenberger, K.: Diabetic Blood-Pressure, 516; Vascular Hypertony, 269
Hjort, A. M.: See Barbour, H. G.
Hoagland, D. R., and Martin, J. C.: Seasons, Crops and Soil, 398
Hocking, F. A.: See Smart, W. A. M.
Hodges, P. C.: See Ostlund, E. O.
Hodgson, A.: Rickets, 577
Hoeve, J. van der: Cataract and Ultraviolet, 124
Hoeven, P. C. F. v. d.: Ovulation, 385
Hoffman, M. H., and Habein, H. C.: Blood Transfusion, 128
Hoffmann: Potatoes and K, 602
Hoffmann, H.: Gastric Juice and Pituitary, 212
Hoffmann, K.: Narcosis and Cerebral Blood Supply, 79
Hoffmann, L.: See Carr, R. H.
Hoffmann, P.: Muscle Tone, 486
Hofmann, F. B.: Electrocardiogram, 41; Independence of Excitability, 20; Smell Theory, 126; Stannius Ligature, 41
Hofmann, W. F.: See Harris, J. A.
Hofvendahl, A.: Cocaine Antagonists, 333
Hogben, L.: Synapsis, 18
Hogue, M. J.: Amœba and Tissue Cultures, 616
Holbøll, S. A.: Sugar Micro Method, 170
Holdaway, C. W.: See Ellet, W. B.
Holker, J.: Opacity of Liquids, 295
Hollenberg, M. S.: See Vincent, S.
Holló, I.: Urine Reaction, 209
Holm, G. E., and Gortner, R. A.: Tryptophane Hydrolysis, 11
Holmes, A. D., and Deuel, H. J.: Hydrogenated Oils, 56; Meat Analyses, 56
Holmes, A. H.: A.-V. Bundle, 498
Holst, A., and Frolich, T.: Dried Cabbage, 203
Holt, E.: Embryo Pituitary, 585
Holthusen, H.: X-Ray Actions, 114
Honcamp, F., and Koch, A.: Digestion, 139
Honeywell, H. E.: Pigeon Blood Sugar, 636
Honeywell, H. E.: See Scott, E. L.
Honigmann, H.: Bird's Vision, 363; Sensation in Turtle, 562
Hooker, D. R.: Capillary and Venule Activity, 45; Capillary Circulation, 193
Hooker, H. D.: Apple Spurs, 98
Hooper, C. H.: Fruit Pollination, 342
Hooper, C. W., and others: Arsphenamine Poisoning, 595
Hooper, C. W.: See Johnston, J. M.
Hooper, J. J.: See Buckner, G. D.
Hopkins, F. G.: Auto-oxidisable Cell Constituent, 301; Muscle Chemistry, 557; Oxidation Mechanisms, 481; Oxidation of Vitamin, 60; Vitamins of Milk, 60
Hopkins, H. S.: Paramœcium Conjugation, 551
Hopkins, M. D.: See Goldmark, J.
Hoppe, E.: See Maltaner, F.
Hoppe, E. N.: See Maltaner, F.
Hoppert, C. A.: See Hart, E. B.
Hoppe-Seyler, G.: Liver Analyses, 506
Horne, E. G. van: See Givens, M. H.
Hornemann, C.: Pilocarpine and Glycogen, 591
Horrax, G.: Physiology of C.N.S., 249
Horrisberger, W.: See Asher, L.
Horst, F.: Adsorption by Charcoal, 219
Hoskins, R. G.: Adrenaline per Rectum, 584; Endocrinology, 581
Hoskins, R. G.: See Ebaugh, F. G.
Höst, H. F., and Hatlehol, R.: Blood Nitrogen, 597
Householder, R.: Spleen in Acidæmia, 387

Houssay, B. A.: Frog Curarisation, 248; Goitre and Water, 146
Houssay, B. A., and Hug, E.: Diuresis and Pituitary, 383; Pituitary and Diuresis, 521; Thyroidectomy, 146
Houssay, B. A., and Sordelli, A.: Snake Venoms, 87 Thyroid and Infection, 519, 520
Houssay, B. A.: See Giusti, L.
Houssay, M. A. C. de: Snake Venom Adsorption, 527
Hovasse, R.: Parthenogenesis in Frog Eggs, 276
Howard, A.: Soil and Plant Diseases, 168
Howard, H. A. H.: See Cammidge, P. J.
Howard, J. W., and Soler, F. L.: Spleen Extracts, 33
Howe, P. E.: Fat of Fæces, 318
Howe, P. R.: Vitamins and Teeth, 578
Howell, K. M.: See Levinson, A.
Howie, L.: See Ponder, E.
Howland, J.: See Park, E. A.
Howland, J.: See Tisdall, F. F.
Howland, R. B.: Pronephros of Amblystoma, 143
Hubbard, R. S., and Wright, F. R.: Adrenalin and Blood, 212
Hudson, A. C.: Perimeter, 170
Huerre, R.: Acids on Juniper Oil, 159
Hug, E.: Diuretic Piqûre, 418; Thyroidectomy, 638
Hug, E.: See Houssay, B. A.
Hughes, J. S., and others: Milk Vitamins, 202
Hughson, W.: See Weed, L. H.
Hugounenq, L., and Florence, G.: Amino-Acids, 406; Urea Effects, 334
Hull, M.: See Fenger, F.
Hulton, H. F. E.: See Baker, J. L.
Hume, E. M.: Condensed Milk Vitamins, 265; Vitamins in Foodstuffs, 264
Hume, E. M.: See Dalyell, E. J.
Humphrey, G. C.: See Hart, E. B.
Humphrey, R. R.: Testis Interstitial Cells, 384
Hünermann, T.: See Skramlik, E. v.
Hunt, C. H.: See Forbes, E. B.
Hunt, J. R.: Tonic Muscles, 618
Hunt, Reid: Arsphenamine, 219
Huntingford, D. B.: See Partingdon, J. R.
Huntoon, F. M., and others: Antibodies, 91
Hurd, A. M.: Light on Spores, 100; Wheat Disinfection, 398
Hürthle, K.: Jaw Dynamometer, 108; Muscle Contraction, 358
Hurtley, W. H.: CO from Urea, 240
Hürzeler, O.: Blood Sugar and Ovary, 515
Hussey, L. D. A.: See Macklin, A. H.
Huston, J.: See Bunting, C. H.
Hutinel, J.: See Widal, F.
Hütten, F. v. d.: Blood Clotting and Spleen, 367
Huxley, J. S.: Heredity, 523
Hyman, L. H.: Metabolic Gradients, 2
Hyman, L. H., and Galigher, A. E.: Metabolic Gradient, 354
Hynes, W. A.: See Sherwin, C. P.

Ide, M.: Ambard Constant, 267; "Bios," 376; Chloroform Dose, 527; Water Regulation, 513
Ide, T.: Tryptophane, 507
Iliescu, C. C.: See Drury, A. N.
Iliescu, C. C.: See Lewis, T.
Inada, R., and Ishihara, M.: Electrocardiogram, 132
Inchley, O.: Cataphoresis of Drugs, 325; Ciliary Movement, 108; Coagulimeter, 625; Electrical Drug Absorption, 642
Ingvar, S.: Tissue Cultures, 116
Inman, O. L.: Plant Respiration, 604
Inouye, B.: Enzyme Heat Production, 206
Inouye, R., and others: Silk Chemistry, 10
Inuganti, N. N.: See Fowler, G. J.
Ionesco, D., and Nasta, M.: Glycosuric Shock, 442
Irvine, A.: See Hanzlik, P. J.
Isaac, S.: Lactacidogen, 484
Isaac, S., and Adler, E.: Tissues and Sugars, 379
Isaacs, R.: See Hachen, D. S.
Isaïca: See Levaditi, C.
Isawa, T.: Amylase, 408
Isener, W.: Ca on Nervous System, 218
Ishihara, M.: Body Colour, 115
Ishihara, M.: See Inada, R.
Ishiwari, N.: Sinomenium Alkaloid, 286
Issekutz, B. v.: Temperature and Narcosis, 644
Itakura, T.: Gastric Juice, 505
Iterson, C. J. A. v.: Plant Galvanic Reflex, 563
Iversen, P.: Blood Phosphate, 189
Iversen, P.: See Bock, J.
Ives, R. F.: Blood-Pressure, 371
Ivy, A. C.: Gastrin, 198
Ivy, A. C., and Oyama, Y.: Pylorus, 432
Iwanoff, N. N.: Yeast Autolysis and Fermentation, 533, 534
Iwaoka, S.: See Inouye, R.
Izawa, Y.: Galvanism on Nerve Cells, 249
Izquierdo, J. J.: Adrenaline and Blood-Pressure, 584
Izumi, G.: Pituitary and Parathyroids, 148

Jackson, C. M.: Embryology Pioneers, 108
Jackson, D. E.: See Mills, C. A.
Jackson, H., and Palmer, W. W.: Uric Acid Estimation, 109
Jackson, H.: See Palmer, W. W.
Jackson, R. F., and Gillis, C. L.: Sucrose Estimation, 6
Jacobi, W.: Pyrexia after Saline Injection, 322
Jacobj, C.: Nerve and Muscle Poisons, 86
Jacobj, W.: Arterioles, 211; Cell Permeability, 82
Jacobsen, A. T. B., and Palsberg, M.: Plasma Chloride, 335
Jacobson, E.: Psychology, 421
Jacoby, M.: Auxoreatic Function of Serum, 253; Enzymes, 647
Jacoby, M., and Frankenthal, K.: Influenza Bacillus, 648
Jaeger, E.: Adrenaline, 454, 643
Jaffé, H.: Blood Formation, 627
Jaffé, R.: Aniline Inhalation, 85
Jager, L. de: Colloidal Cu Test, 269
Jameson, A. P., and Atkins, W. R. G.: Silkworm, 300
Janet, M. P.: See Mestrezat, W.
Jannink, E. T., and Feenstra, T. P.: K and Uranium, 428
Japan Medical World: Review, 400
Jappelli, G.: Lymph Formation, 135; Hæmolysis, 625
Jarisch, A.: Lipoids and Hæmolysis, 154
Jarno, L., and Marke, D.: Opium on Stomach, 590
Jarno, L., and Vandorfy, J.: Duodenal Regurgitation, 261
Jauré-Fremet (Fauré-Frémiet?), E., and others: Microchemical Reaction of Lung, 19
Jellenigg, K.: See Hamburger, F.
Jenkins, C. E.: Decalcifying Fluid, 172
Jenny, E.: Quinidine, 279
Jensen, J. P.: See Emge, L. A.
Jensen, V.: Picro-Carmine, 172; Immersion Fluid, 294
Jenson, C. O.: Thyroid and Metamorphosis, 147
Jephcott, H., and Bacharach, A. L.: Dried Milk, 265

Jeppsson, K.: Phosphates and Spasmophilia, 283
Jippö, A.: See Edelstein, F.
Joachimoglu, G.: Camphor as Helmintic, 83; Digitalis, 593; Hg on Yeast, 645; Narcosis, 452
Jodlbauer, A., and Haffner, F.: Dyes as Hæmolytics, 423; Fluorescent Action, 354
Joël, E.: Urine Viscosity, 445
Joffe, J. S.: Soil Acidity and Alfalfa, 344
Joffe, J. S.: See Lipman, J. G.
Johansen, A. T.: H-ion and Bacteria, 539
Johns, C. O., and Finks, A. J.: Bean Proteins, 262; Pea Proteins, 199; Soy-Bean Flour, 199
Johns, C. O., and Gersdorf, C. E. F.: Tomato Seed Proteins, 285
Johns, C. O., and Jones, D. B.: Lactalbumin, 173
Johns, C. O.: See Finks, A. J.
Johns, C. O.: See Jones, D. B.
Johns, C. O.: See Waterman, H. C.
Johnson, A. B.: See Atanasoff, D.
Johnson, R.: See Eddy, W. H.
Johnson, S. E.: Sacral Sympathetic, 121
Johnston, E. S.: Greenhouse Climate, 228; Lightning on Potatoes, 343; Potato Culture, 340
Johnston, J. M.: Dried Milks, 509
Johnston, J. M., and Hooper, C. W.: Dried Milks, 509
Jolly, W. A.: Frog Reflex Times, 23
Joly, J.: Colour Vision, 362
Jonas, L.: See Fussell, M. H.
Jones, C. M.: See Burwell, C. S.
Jones, D. B., and Johns, C. O.: Lactalbumin, 612
Jones, D. B.: See Johns, C. O.
Jones, D. B.: See Waterman, H. C.
Jones, H. M.: Metabolism Apparatus, 141
Jones, J. H.: See Hart, E. B.
Jones, J. S., and Bullis, D. E.: Mn in Legumes, 599
Jones, L. H., and Shrive, J. W.: Iron and Wheat Growth, 340
Jones, M. R., and Nye, L. L.: Ca and P of Blood, 426
Jonescu, A.: Ptomaine Separation, 112
Jonescu, A., and Vargolici, V.: Sugar Estimation, 170
Jonesco, S.: Anthocyans, 530
Jordan, H., and Schwarz, B.: Gas Metabolism of Worm, 108
Jordan, H. E.: Enamel Organ, 413; Marrow Cell Cytology, 179; Osteoclasts, 21; Pineal Body, 585
Jörgensen, G.: Leucocytes and Posture, 35
Joseph, D. R.: Sphincter Iridis, 184
Jötten, K. W.: Yeast in Bacteria, 601
Jöttermann, U.: Alcohol Effects, 80
Jucci, C.: Urates in Termites, 615
Juhász, A.: Complementary After-Images, 27
Jung, J.: Chlorine in Plants, 223
Junkersdorf, P.: Liver and Glycogen, 198: Liver Glycogen and Fat, 632; Physiology of Liver, 138
Juquelier, P.: Asparagus as Food, 633
Jurgens: Drug Storage in Tissues, 83
Jürgensen, E.: Capillary Circulation, 193
Justin-Besançon, L.: See Schulmann, E.
Justin-Mueller, E.: Morin and Quercitrin, 95; Pentose in Urine, 324

Kabeda, I.: See Matsusaki, S.
Kahho, H.: Metals on Plants, 647; Plant Protein Coagulation, 394; Protoplasma Permeability, 647; Salts on Protoplasm, 537
Kahn, M.: Bile Flow, 373
Kahn, M., and Hadjopoulos, L. G.: Blood Calcium, 311
Kahn, M.: See Gies, W. J.
Kahn, R. H.: Muscular Tone, 618; Thyroid Feeding of Invertebrates, 638
Kahn, R. L.: Complement Fixation, 529
Kaminura, N.: Hyperthyroidism, 519
Kammerer, H.: Bacteria and Hb, 92
Kampmeier, O. F.: Kidney Development, 323
Kanda, S.: Bioluminescence, 114
Kanitz, A.: Uric Acid Salts, 477
Kapfhammer, J.: Mercapturic Acids, 612
Kappeller, G., and Gottfried, A.: Detection of Cow's Milk, 150
Kappers, C. U. A.: Neurobiotaxis, 418
Karczag, L.: Oxidation Catalysts, 293, 410; Order of Sequence, 648
Karczag, L., and Hajós, K.: Order of Mixing, 529
Karraker, P. E.: Soil Moisture, 344
Karrer, P., and others: Polysaccharides, 238
Karrer, P., and Widmer, F.: Cellobiose, 296
Karsner, H. T.: Blood Transfusions, 34
Karsner, H. T., and others: Blood Diastase, 515
Káš, V.: See Němec, A.
Kasper, F.: Obstruction of Portal Vein, 55
Katayama, K.: See Sakagachi, K.
Katsaka, B.: See Murada, K.
Katsch, G.: Alcapton and Acetone, 268
Katsch, G., and Nemet, G.: Alcapton Chromogens, 445
Katz, L. N.: Ventricular Systole, 256
Kauffmann, F., and Steinhausen, W.: Reflex Time, 489
Kaufman, I.: Myelination of Cord, 418
Kawase, S., and others: Chrysalis Oil, 405; Silkworm Physiology, 242
Kay, M. B.: Hypopituitarism, 327
Kay, W. E., and Brock, S.: White Adrenal Line, 273
Kayser, E.: N Fixation, 289; Azotobacter, 539
Keilin, D.: Pharyngeal Gland of Worm, 15
Keith, A.: Evolutionary Wounds, 401
Kellaway, C. H.: Suprarenals in Beri-Beri, 57
Kellaway, C. H.: See Dale, H. H.
Keller, R.: Dielectric Constants, 172
Kelley, C. M.: See Wells, F. L.
Kelley, C. M.: See Burtt, H. E.
Kelley, W. P., and Cummins, A. B.: Citrus Leaves, 394; Salt on Soils, 345
Kelling, G.: Hyperchlorhydria, 54
Kendall, E. C.: Internal Secretions, 271; Iodine of Tissues, 211
Kennard, D. C.: See Philips, A. G.
Kennaway, E. L.: Micro-N Method, 471
Kennedy, C.: See Palmer, L. S.
Kenoyer, L. A.: Forest Ecology, 649
Kepner, W. A., and Whitlock, W. C.: Amœbic Food Reactions, 14
Kerb, J., and Zeckendorf, K.: Pyruvic Acid in Fermentation, 646
Kestner, O.: Arc Light Effects on Blood-Pressure, 133; Regeneration of Red Cells, 130; Hermaphrodites, 641
Keussler, H. v.: Hermaphroditism, 77
Key, J. A.: Red Cell Structure, 616
Khorozian, K. G.: See Rockwood, E. W.
Kidd, F.: See Briggs, G. E.
Kieley, C. E.: Emotions and Suprarenals, 31
Kiessling, W.: Alkyl Chlorides on Heart, 219
Kiliani, H.: Sugar Chemistry, 238
Killian, J. A., and Sherwin, C. P.: Blood in Pregnancy, 450
Killian, J. A.: See Myers, V. C.
Killian, K.: Tomato Disease, 465
Kindred, J. E.: Phagocytosis and Clotting, 615
King, C. V.: See Riddle, O.

King, H.: See Acton, H. W.
King, J. L.: Menstrual Blood, 586
King, J. T.: Basal Metabolism, 578
Kingsbury, F. B., and Swanson, W. W.: Hippuric Acid in Nephritis, 204, 549; Hippuric Renal Test, 444
Kinkead, R. W.: New Indicator, 5
Kinloch, J. P.: See Orr, J. B.
Kinney, E. J.: See Buckner, G. D.
Kinney, M.: See Nelson, C. F.
Kinose, J.: See Sasaki, T.
Kipp, H. A.: Blood Cholesterol, 39
Kirkham, W. B.: White Mouse, 2
Kirsch, R.: Visometer Tests, 4
Kirste, H.: Atropine-Muscarine Antagonism, 331
Kisch, B.: Fibrillation of Ventricle, 498; Heart Alternation, 43
Kitchen, J. M. W.: Temperature and Milk, 277
Kiyono, K., and Higashihara, K.: Arterio-sclerosis, 221
Klason, P.: Spruce Cellulose, 600
Klee, P.: Stomach Innervation, 373
Kleijn, A. de: Tonic Eye Reflexes, 29; Tonic Reflexes, 417
Kleijn, A. de, and Magnus, R.: Labyrinth Reflexes, 29; Otolith Functions, 28
Klein, G.: Anthochlor, 223
Klein, G.: See Ellinger, A.
Klein, J. G.: Tetania Parathyreopriva and Ca, 326
Klein, P.: See Traube, J.
Klein, W.: Cellulose Fermentation in Ox, 316
Klein, W., and Steuber, M.: Bomb Analyses, 403
Kleiner, I. S.: Blood Sugar Estimation, 6
Kleinmann, H.: Nephelometry, 4
Kleitman, N.: See Salant, W.
Kleitman, N.: See Scott, E. L.
Klett, R. E.: See Kober, P. A.
Klinger, R.: Guanidine, 447
Klinger, R.: See Farner
Klinger, R.: See Herzfeld, E.
Klinkert, D.: Allergical Immunity, 284
Klöcker, A.: Sugar Assimilation by Yeast, 163
Klose, R.: Brain of Prodigy, 26
Knaffl-Lenz, E.: Ultra-Filters, 4
Knape, E.: Gallotannic Acid, 286
Knoevenagel, E., and Eberstadt, O.: Swelling Experiments, 337
Knudson, A.: Blood Cholesterol, 39
Knudson, L.: Invertase of Roots, 160
Kobayaschi, S.: See Tsujimoto, M.
Kober, P. A., and Klett, R. E.: Nephelometer-Colorimeter, 350
Koch, A.: See Honcamp, F.
Koch, E.: Pulsus Alternans, 43
Kochmann, M.: Action of CO, 48; Cocaine on Heart, 500; Pituitary Standardisation, 521
Kochmann, M.: See Apitz, G.
Kockel and Zimmermann: HF Poisoning, 87
Koda, C.: See Asher, L.
Kodama, S.: Olfaction Theory, 251
Kodzuka, T.: Shell Pigment, 552
Koeckert, H. L.: See Karsner, H. T.
Koellner, H.: Colour Vision, 419
Koeppe, L.: Vision Theory, 250
Koers, C. H.: See Harst, J. C. v. d.
Kofman, T.: See Cluzet, J.
Koga, T.: Japanese Foods, 264
Kögel, R. P.: CO_2 Assimilation, 164
Kohler, D.: Anthocyanin, 530; Anthocyan Formation, 458
Köhler, E.: Yeast Fermentation, 96; Yeast Physiology, 98
Köhler, W.: Chimpanzee Psychology, 622
Kohn, A.: Interstitial Cells, 77
Kohs, S. C.: Mental Efficiency Test, 31
Kokestu, R.: See Livingston, B. E.
Kolkwitz, R.: Osmotic Cell, 158: Chlorophyll and Leaf Colour, 160; Crystalline Chlorophyll, 223
Kollmann, G.: Uric Synthesis in Body, 613
Kolls, A. C.: See Hooper, C. W.
Kolm, R., and Pick, E. P.: K and Heart Automatism, 131; Ca and Heart Nerves, 369; Heart Drugs, 500
Kolmer, J. A.: Modes of Drug Administration, 591
Kolmer, J. A.: See Raiziss, G. W.
Kolmer, W.: Sagittal Organ, 491
Komuro, K.: Taste and Temperature, 364
Kondo, S.: Renal and Peripheral Vessels, 526
König, A.: Pepsin and Rennet, 53
Koning, J. W.: Blood Glycolysis, 442
Koopmann, H.: Parathyroid, 447
Koopman, J.: Acetone in Cerebro-Spinal Fluid, 252; Acetone in Urine, 270; Occult Blood, 497
Kopaczewski, W.: Alimentary Anaphylaxis, 335; Shock and Surface Tension, 528; Surface Tension and Shock, 156; Surface Tension and Anaphylaxis, 283; Surface Tension Apparatus, 236
Kopeloff, L.: See Kopeloff, N.
Kopeloff, N., and Byall, S.: Invertase of Moulds, 536
Kopeloff, N., and Kopeloff, L.: Cane Sugar Fungi, 341
Korb, J. H.: See Stoland, O. O.
Korenchevsky, V.: Rat Rickets, 510
Kornfeld, W.: Pigment of Anura, 20
Kosaka, K., and Seki, M.: Red Cell Charge, 255, 493
Koskowski, W., and Maigre, E.: Methylene Blue, 416; Methylene Blue Effects, 469
Kossel, A., and Giese, G.: Chloroma Pigments, 240
Kostitch, A.: Spermatogenesis and Alcohol, 278
Kotschnew, N. P.: See London, E. S.
Kottmann, K.: Blood Tissue Relations, 89
Kowallek, A.: High Frequency Treatment, 134
Kozawa, S., and Miyamoto, N.: Red Cell Permeability, 624
Krafka, J.: Temperature Coefficients, 294
Kraft, A.: Potatoes, 161
Kraft, A., and Leitch, N. M.: Morphine in Septicæmia, 525
Kramer, B., and Greene, C. H.: Reaction of Milk, 216; Titration of Milk, 216
Kramer, B., and Tisdall, F. F.: Ca and Mg Estimation in Serum, 171; Ca and Mg in Plasma, 109; Ca and Mg in Serum, 425; K Estimation, 237; Na in Serum, 311; Na, K, Ca, and Mg in Blood, 548
Kramer, B.: See Tisdall, F. F.:
Kramer, M. M.: See Sherman, H. C.
Kranz, F. W.: Audition, 621
Krasinska, Z.: See Parnas, J. K.
Kraus, E. G., and Ralston, G. S.: Apple Pollination, 342
Kraus, E. J.: Hypophysis in Diabetes, 143; Pancreas and Pituitary, 447, 640
Kraus, R., and Sordelli, A.: Serum Antitoxins, 156
Kreger, M.: Starvation, 66
Kreibich, C.: Basophile Red Cells, 554; Lipochrome, 118
Kremers, E.: Medicinal Plants, 94
Kreidl, A., and Gatscher, S.: Beats, 492; Central Beat Production, 126; Noise Localisation, 28
Kreidl, A.: See Frölich, A.
Krieg, H.: Tongue Papillæ in Rabbit, 482
Krieger, K. I.: Trypsin of Fæces, 54

Kriens, H.: See Bachem, C.
Kries, J. v.: Muscular Contraction, 485
Kriss, M.: Temperature of Cows, 321
Krogh, A.: Bloodvessel Reactions, 571
Krogh, A., and Harrop, G. A.: Capillary Tonus, 134; Stasis and Œdema, 134
Krogh, A., and Schmit-Jensen, H. O.: Cellulose Fermentation, 66
Krönig, W.: See Meier, K.
Krüger, R.: See Michaelis, L.
Kruse, T. K.: Methæmoglobin Formation, 187; CO in Blood, 350
Krzyszowsky, C.: See Amantea, G.
Kucera, F. J.: See Hirschfelder, A. D.
Kudo, T.: Effect of Thirst, 321
Kuga, R.: Blood Sugar in Nephritis, 515
Kühlewein, M. v.: Chlorine in Intestine, 575
Kuhn, R.: See Willstätter, R.
Kukulka, J.: Adrenalin on Capillaries, 71
Külbs, F.: Chick Embryos, 132
Kulenkampff, A.: See Wieland, H.
Kulp, W. L.: See Anderson, R. J.
Külz, F.: Colloidal Arsenic, 333
Kumagawa, H.: Aldehydes in Fermentation, 647; Methylene Blue and Yeast, 539, 646
Kundel, W. M.: See Macht, D. I.
Kuno, N.: See Hayakawa, K.
Kuno, Y.: Blood Sugar and Heat Regulation, 514
Kuntz, A.: Testis Degeneration, 214
Kupelwieser, E.: Snake Heart, 131
Kupperman, F. V.: See Dawson, P. M.
Kuramitsu, C., and Loeb, L.: Lactation, 277
Kuramitsu, C.: See Loeb, L.
Kürten, H.: Corpuscle Sedimentation and Lipoids, 128
Kürten, H.: See Abderhalden, E.
Küster, E.: Plant Development, 227
Kutscher, F.: See Ackermann, D.
Kyrklund, R.: Premature Infants, 284

Labbé, A.: Adaptation of Dunaliella, 241; Heterogeneous Fecundation, 641
Labbé, H., and Toni, G. de: Blood Calcium, 549
Labbé, H.: See Labbé, M.
Labbé, M., and Labbé, H.: Fat Digestion, 137
Labbé, M., and others: Hyperglycæmia, 441
Labbé, M., and Stévenin, H.: Thyroid and Respiration, 583
Labes, R.: Action of Salts on Protein, 110
Ladd, W. S., and Palmer, W. W.: Ketosis, 143
Ladreyt, F.: Liver Pigment, 335
Laer, M. H. van: Malt Emulsin, 286
Laet, M. de: Spectra of Alkaloids, 281
Lafont, R.: See Grynfeltt, E.
Lafora, G. R., and Prados, M.: Corpus Callosum, 25
Lafora, G. R., and Such, M. P. y: Cerebro-Spinal Fluid, 32
Laird, D. A.: Time Control, 170
Lamb, F. H.: Staining and Drying Apparatus, 6
Lambie, C. G.: See Cushny, A. R.
Lameere, A.: Stomach Development, 574
La Mer, V. K.: Antiscorbutic Vitamin, 634
La Mer, V. K., and Campbell, H. L.: Organs in Scurvy, 61
La Mer, V. K., and others: Vitamin Destruction, 140
Lamson, P. D., and Roca, J.: Liver and Blood, 576
Landauer, K.: Muscle Tonus, 120
Landsteiner, K.: Antigens, 457
Lane, W. A.: Thoracic Respiration, 630
Lang, F.: See Hiltner, L.
Lang, H.: See Lang, S.
Lang, L.: See Karrer, P.
Lang, R. S.: See Fraser, L. McP.
Lang, S., and Lang, H.: NaF on Pancreatic Diastase, 241
Langdon, S. C., and Gailey, W. R.: CO in Algæ, 100
Lange, B.: Effect of Air Currents, 321
Lange, H.: See Stepp, W.
Lange, L. C.: See Barber, W. H.
Langecker, H.: Digestion of Albumoses, 351; Fluorescence of Porphyrins, 381; Lead Precipitation, 477; Nails, Composition of, 352
Langenberger, L. L.: See Levinson, A.
Langer, H.: Plant Tropisms, 165
Langeron, L.: See Arloing, F.
Langeron, M.: Review, 400
Langfeldt, E.: Glycogen and Liver Diastase, 268; Iron and Metabolism, 440
Langley, J. N.: Review, 650
Langlois, J. P.: Treadmill for Marching, 294
Langlois, J. P.: See Chailley-Bert, P.
Lanz, W.: Gastric Acidity, 575
Lapicque, L.: Surface and Metabolism, 376
Lapicque, L., and Emerique, L.: Fungus Chemistry, 645
Lapicque, L., and Lapicque, M.: Chronaxie and Hypotony, 359; Laminaria Salts, 458
Lapicque, M.: Nicotine on Muscle, 246
Lapicque, M.: See Lapicque, L.
Laquer, F.: Muscle Carbohydrates, 487
Laquer, F.: See Embden, G.
Laqueur, E., and Magnus, R.: Gas Poisoning, 281
Laroche, G.: See Chauffard, A.
Larsell, O.: Nerve Endings of Lung, 193
Larsell, O., and Mason, M. L.: Lung Nerve, 630
Larson, E. E., and others: Diabetes Insipidus, 383
Lasareff, P.: Review, 346
Lasch, W.: Salts and Diuresis, 280; Ultra-violet Light on Ca Balance, 579
Lashley, K. S.: Brain and Learning, 622
Laska-Mintz, E.: See Parnas, J. K.
Latarjet, and others: Stomach Nerves, 316
Latta, J. S.: Intestine Lymphatic Tissue, 356
Latzel, R.: Quinine Vasodilatation, 81
Latzel, R., and Stejskal, K.: Skin Absorption, 555
Laubry, C., and others: Limb Circulation, 502
Laugier, H.: See Banu, G.
Launoy, L., and Fujimori, Y.: Local Anæsthetics, 79
Launoy, L., and Lévy-Bruhl: Benzene Action, 83
Laurence, J. V.: See Harris, J. A.
Laurens, H.: See Detwiler, S. R.
Laurin, I.: See Euler, H. v.
Lauritzen, M.: Diabetes, 207
Lautenschläger, L.: Lactones as Anthelmintics, 643
Lawaczeck, H.: Lactacidogen, 484
Laxa, O.: Pentose in Milk, 588
Leake, W. H.: See Mackenzie, G. M.
Lebert, M.: See Chabanier, H.
Le Breton, E.: Liver Lipoids, 612
Lécaillon, A.: H_2SO_4 on Silkworm Eggs, 242
Le Clerc, J. A., and Breazeale, J. F.: Limed Wheat, 537
Leclerc, P.: See Bardier, E.
Lecoq, R.: Vitamins, 59
Lecoq, R.: See Perrot, E.
Ledert, S.: See Mestrezat, W.
Lee, A. B.: Chromosomes, 18
Lee, A. B., and Gatenby, J. B.: Review, 400
Lee, F. W.: See Whipple, G. H.
Leersum, E. C. van: Dietetics, 632
Leeuwen, W. S. van: Colloids in Pharmacology, 151; Sedative Drugs, 278

Leeuwen, W. S. v., and Brocke, C. v. d.: Pilocarpine and Atropine, 454
Leeuwen, W. S. v., and Eerland, L.: Drug Adsorption, 86
Leeuwen, W. S. v., and Maal, P. H.: Belladonna Extract, 643
Leeuwen, W. S. v., and Made, M. v. d.: Sensitisation to Drugs, 86
Leeuwen, W. S. v., and Szent-Györgyi, A. v.: Colloids and Drugs, 643
Leeuwen, W. S. v., and Verzár, F.: Vitamins and Poisons, 577; Drugs and Vitamins, 634
Leeuwen, W. S. v,, and Zeijdner, J.: Adsorption of Drugs, 282; Colloids and Drugs, 280
Leeuwen, W. S. v.: See Eerland, L.
Legendre, R.: Chloral on Nerve, 305
Legrand: Lactose and Maltose Estimation, 238; Maltose and Lactose, 535
Le Heux, J. W.: Choline in Intestine, 505
Lehman, E. P.: Blood Phosphate, 626
Lehmann, G.: Sympathetic Tone, 274
Lehmann, G.: See Atzler, E.
Lehmann, W.: Anterior Root Sensories, 121
Lehnerdt, F., and Weinberg, M.: Rickets and Adrenaline, 584
Leichsenring, J. M.: See Burge, W. E.
Leist, M.: Duodenal Rennin, 506; Gastric Chloride, 505
Leitch, N. M.: See Kraft, A.
Leiter, L.: Uræmia, 528
Leleu, A.: See Garrelon, L.
Lemeland, P.: Blood Fat and Lipoids, 309
Lemmermann, O., and Wiessmann, H.: Nitrogen Manures, 99
Lenk, E.: Barium Meals, 170
Lennartz, E.: Capillary Reactions, 571
Lenoble, E., and others: Alcohol in Cerebro-Spinal Fluid, 128
Lenz, E.: Acridine Derivatives, 217
Le Plastrier, G. M.: Loranths, 538
Lermann, W. W., and others: Gastric Analysis, 261
Leshke, E.: Xanthochromia of C.S. Fluid, 252
Lesser, E. J.: Liver Glycogen, 440; Thymus and Gonads, 638
Leupold, E.: Thymus and Testis, 70
Levaditi, C., and others: Rabbit Spirochætosis, 335
Levaditi, C.: See Sazerac, R.
Levend, W. H.: Ionium and Heart, 629
Levene, P. A.: Animal Nucleic Acids, 475; Phosphatides, 475; Sugar Acids, 549; Thymus Nucleic Acid, 550
Levene, P. A., and Clark, E. P.: *d*-Ribohexosaminic Acids, 173
Levene, P. A., and Meyer, G. M.: Galactonic Lactone, 238; Phosphoric Sugar Esters, 549
Levene, P. A., and Rolf, I. P.: Brain Lecithin, 239; Lecithin Fatty Acids, 199
Levene, P. A., and Simms, H. S.: Liver Lecithin, 475
Levin, I.: See Sturges, M. M.
Levin, S.: Goitre, 272
Levina, Mlle.: See Bierry, H.
Levine, V. E., and Gianelli, S. A.: Renal Lipase, 208
Levinson, A.: Cerebro-Spinal Fluid Cholesterol, 252
Levy, F.: Giant Cells, 482
Levy, J.: Milk Foods, 277
Levy, R. L.: See Cohn, A. E.
Lévy-Bruhl: See Launoy, L.
Levy-Lenz, and Schmidt, P.: Steinach Operation, 275
Lewin, L.: T.N.T. Poisoning, 333
Lewis, C. I., and others: Pear Harvest, 463
Lewis, H. B.: Hippuric Acid, 205
Lewis, H. B., and Hill, R. M.: Gastric Inversion, 197
Lewis, H. B., and Root, L. E.: Cystine Oxidation, 205
Lewis, H. B.: See Christman, A. A.
Lewis, H. B.: See Stearns, G.
Lewis, T.: Auricular Fibrillation, 191
Lewis, T., and Drury, A. N.: Heart Muscle Excitability, 312
Lewis, T., and others: Auricle Circus Movements, 312; Circus Movement, 569; Vagus and Auricle, 191
Lewis, T.: See Drury, A. N.
Lewis, T.: See Feil, H. S.
Lewis, W. H.: $KMnO_4$ on Mesenchyme, 19
Lewis, W. H., and Webster, L. T.: Lymphocyte Migration, 116; Wandering Cells, 480
Lewy, F. H.: See Brugsch, T.
Leyton, A. S. F.: Obituary, 468
Lhermitte, J.: Corpus Striatum, 490
Lian, C., and Welti, H.: Aneurysmal Bruits, 629
Libbrecht, W.: Heart and K, 42; Cardiac Paradox, 569
Lichtenstern, R.: Testis Transplants, 585
Lieb, H.: Lues Reaction, 393
Lieb, H.: See Herzig, J.
Lieben, F.: See Fürth, O.
Liebermann, L.: See Neuberg, C.
Liebermann, P. v.: Polar Excitation of Arteries, 629
Liebesny, P.: Light and Metabolism, 66
Liebreich, E.: Charcot's Crystals, 565
Liesche, O.: See Beckmann, E.
Lifschütz, I.: Cholesterol Dibromide, 296; Wool Acids, 475; Wool Fat, 238
Lillie, F. R.: Copper and Fertilisation, 614; Fertilisation, 17
Lillie, R. S.: Salt Antagonism, 412
Lillie, R. S., and Baskervill, M. L.: Parthenogenesis, 479
Limerick, O. V.: See Gies, W. J.
Lindahl, G.: See Widmark, E. M. P.
Lindner, E.: See Moraczewski, V. de
Lindner, P.: Bacterial Fats, 224; Yeast Growth, 229
Ling, A. R., and Nanji, D. R.: Phenylhydrazine Estimation, 473
Linhart, G. A.: See Lipman, C. B.
Linzenmeier, G.: Blood Sedimentation, 35, 128
Lion, H.: See Maier, M.
Lipman, C. B., and Linhart, G. A.: Fertiliser, 601
Lipman, J. G., and Blair, A. W.: Cropping, 606; N Fertilisers, 291
Lipman, J. G., and Joffe, J. S.: Sulphur Oxidation, 338
Lipman, J. G., and others: S and Plant Crops, 345
Lipps, G. F.: Life, 169
Lipschitz, W., and Gottschalk, A.: Tissue Reactions, 589
Lipschitz, W., and Hertzig, G.: Pseudoanoxybiosis, 590
Lipschütz, A., and Audova, A.: Muscle Atrophy, 415
Lipschütz, A., and others: Partial Castration, 329, 522; Testis Internal Secretion, 275
Lipschütz, A.: See Loewy, A.
Lisi, L. de: Genital Hormones in Tortoise, 276
Lissy, R.: Bee Venom, 333
Litman, M.: See Siperstein, D. M.
Litthauer, M.: Vagus and Stomach, 137
Little, C. C.: Tortoise-Shell Cat, 641
Little, C. C., and Gibbons, M.: Sex Lethal Factors, 150

Little, C. C.: See Strong, L. C.
Littmann, S.: See Cole, H. N.
Livingston, A. E.: Thymol and Cervacrol Toxicity, 387
Lloyd, D. J., and others: "Rope" in Bread, 139
Lloyd, F. E.: Bananas, 397; Dyes and Mucilages, 457; Plant Growth, 398
Lobo-Onell, C.: See Chabanier, H.
Lockwood, B. C.: See Freund, H. A.
Loeb, C.: Accommodation, 250
Loeb, J.: Anomalous Osmosis, 611; Casein as Ampholyte, 111; Casein Solutions, 174; Donnan Equilibrium, 295; Donnan Equilibrium and Viscosity, 404; Ion Series and Proteins, 7; Parthenogenesis, 214; Protein Viscosity, 472, 473; Proteins as Colloids, 174
Loeb, J., and Loeb, R. F.: Protein Pp and Electrolytes, 611
Loeb, L., and Kuramitsu, C.: Lactation, 216
Loeb, L.: Amœboid Movements, 177, 243, 481; Growth of Transplants, 244; Nutrition and Ovary, 641; Transplantation and Individuality, 107
Loeb, L.: See Kuramitsu, C.
Loeb, R. F.: See Loeb, J.
Loeb, R. F.: See Palmer, W. W.
Loeper, M., and others: Vagus Nerve Chlorides, 247
Loevenhart, A. S., and Schlomovitz, B. H.: Circulation Time, 370
Loew, O.: Calcium Equilibrium, 579
Loewi, O.: Cardiac Nerves, 427; K and Ca on Heart, 258; Lipoids, K, and Ca on Heart, 131; Protein Problems, 110
Loewy, A., and others: Stomach Operation, 276
Loewy, G.: See Gosset, A.
Löffler, B.: Plant Movements, 164
Löffler, W., and Rütimeyer, W.: Methyl Bromide Poisoning, 84
Löffler, W.: Endocrines and C.N.S., 581
Lohms, F., and Hansen, R.: Bacterial Nodules, 539
Lombard, E.: Vestibule and Equilibration, 28
London, E. S., and Kotschnew, N. P.: Vasostomy for Blood Samples, 3
Long, M. L.: See Underhill, F. P.
Longo, B.: Parthenocarpy, 649
Lopez-Lomba, J., and Portier, P.: Rabbit Avitaminosis, 375
Lo Priore, G.: Teratology, 538
Lord, F. T., and Nye, R. N.: Pneumonia Exudate, 456
Lorenz, W. F.: Pipette, 548
Lothrop, A. P.: Renal Glycosuria, 207
Lottermoser, A.: Starch Iodide, 474
Louis, D. J.: Black Spider Poisoning, 282
Louria, H. W.: Intestinal Obstruction, 425
Lowe, E. R.: See McClendon, J. F.
Lövgren, S.: Yeast Invertase, 96; Urease, 409
Löwe, F.: See Hirsch, P.
Löwenthal, K.: Adrenalin Formation, 272
Lucas, W. P.: Blood in Infants, 425
Lucibelli, G.: Suprarenal Insufficiency, 147
Luckett, J. D.: See Noyes, H. A.
Luckhardt, A. B., and Carlson, A. J.: Lung Motor Mechanisms, 122; Lung Reflexes, 194; Vagal Pulmonary Vasomotors, 260
Luckhardt, A. B.: See Carlson, A. J.
Luckmann, V.: See Fischer, H.
Lüders, H.: See Windaus, A.
Ludford, R. J., and Gatenby, J. B.: Dictyokinesis, 355
Ludwig: Chlorosis in Plants, 228
Lüers, H.: Colloid Test for C.S.F., 32
Luger, A.: Oligodynamic Action, 353; Quinine Hæmolysis, 366
Lührig, H.: Starch Estimation, 238
Lumière, A.: Anaphylaxis, 283; Dead Leaves, 538; Plant Vitamins, 539; Surface Tension and Anaphylaxis, 156
Lumière, A., and Couturier, H.: Anaphylaxis, 88; Plant Anaphylaxis, 543; Pregnancy and Anaphylaxis, 283; Shock and Precipitation, 528
Lumière, A.: Review, 399
Lund, C. C., and others: Particle Distribution, 129
Lund, E. J.: KCN on Paramœcium, 479; Organic Polarity, 552
Lundegårdh, H.: Phototropism, 165; Ecology, 603
Lundgren, R., and others: Butter and Margarine Digestion, 262
Lundsgaard, C., and Beyerholm, O.: Pulse Wave, 350
Lupu, H.: Fish Blood, 565
Lüscher, E.: Frog Heart Metabolism, 40; Gas Metabolism of Heart, 256
Lusk, G.: Basal Metabolism, 437; Fat from Protein, 66; French Science, 1; Undernutrition, 635
Lustig, A., and Franchetti, A.: Pellagra, 634
Lutembacher, R.: Intravenous Salicylate, 330
Luten, D.: Digitalis Therapy, 81
Lux, H.: See Ambard, L.
Lyding, G.: Lactacidogen, 484
Lydston, G. F.: Testis Grafts, 76
Lyle, H. W., and De Souza, D.: Review, 607
Lyle, W. G.: See Caldwell, W. E.
Lynch, R. S.: Liver Cultures, 356
Lynn, M. J.: Geotropic Response, 461

Maal, P. H.: See Leeuwen, W. S. v.
MacArthur, J. W.: Vital Gradients, 479
MacBride, E. W.: Acquired Characters, 3
Maccabruni, F.: Blood Sedimentation, 495
Macco, G. Di: See Musumeci, G.
MacDonald, M. B., and McCollum, E. V.: Yeast Culture, 163
MacDougal, D. T.: Colloid Swelling, 94; Plant Habitats, 605; Yeast Vitamins, 604
MacDowell, E. C.: Alcoholism, 217
Macfie, J. W. S.: See Yorke, W.
Machens, A., and Cordes, F.: Milk Catalase, 151
Machiela, J.: Heart Dynamics, 420
Macht, D. I.: Alcohols, Toxicity, 84; Anæsthetic Absorption from Urinary Tract, 144; Cinnamein, 331; Prostate, 213
Macht, D. I., and Bloom, W.: Alkaloids on Behaviour, 127; Antipyretics on Behaviour, 127; Cocaine on Cerebrum, 154; Digitalis, 623; Drugs on Tadpoles, 452; Effect of Cocaine, 331; Prostate on Behaviour, 127; Toxicity of Drugs, 389, 390
Macht, D. I., and Kundel, W. M.: Antiseptic Aromatics, 152
Macht, D. I., and others: Toxicity of Drugs, 391
Macht, D. I., and Ting, G. C.: Bronchial Responses, 592
MacIntire, W. H., and Mooers, C. A.: Lysimeter, 345
Mackay, H. M. M.: Fat-Poor Diet, 264; Rickets, 56
MacKeith, N. W., and others: Second Wind, 316
Mackenzie, G. M., and Baldwin, L. B.: Skin Reactions, 457
Mackenzie, G. M., and Leake, W. H.: Serum Disease, 283
Mackenzie, G. M.: Serum Desensitisation, 392
Macklin, A. H., and Hussey, L. D. A.: Scurvy, 437
MacLaughlin, J. A.: See Brauns, D. H.

Maclean, H., and Wesselow, O. L. V. de: Sugar Tolerance, 50
MacLean, I. S., and Thomas, E. M.: Sterols, 296
MacLean, I. S.: Yeast Fat, 338
MacLeod, F. L.: See Sherman, H. C.
MacLeod, J. J. R., and Taylor, N. B.: Hot and Cold Applications, 378
Macleod, J. J. R.: Blood Lactic Acid, 196; Blood Sugar, 268; Periodic Breathing, 196; Respiratory Cectre, 46
MacLeod, J. J. R.: See Fraser, L. McP.
MacNider, W. de B.: Blood in Nephritis, 196; Kidney in Hg Poisoning, 152; Kidneys after Anæsthesia, 380
Macomber, D.: See Reynolds, E.
MacTaggart, A.: Fertilisers, 601
Macy, I. G., and Alter, N. M.: Cotton Seed Foods, 201
Macy, I. G.: See Givens, M. H.
Made, M. v. d.: See Leeuwen, W. S. v.
Maeda, M.: Ergot for Hæmorrhage, 453
Maestrini, D.: Emulsin, 536; Malt Lipase, 600; Ptyalin and Acid, 175; Ptyalin and Starch, 408
Magath, T. B.: Renal Insufficiency, 324
Magath, T. B.: See Mann, F. C.
Magayania, T.: Brain Cholesterol, 560
Magnan, A.: Wing Muscles of Birds, 245
Magne, H.: Cost of Marching, 64
Magne, H.: See Meyer, A.
Magness, J. R., and others: Pruning, 288
Magness, J. R.: Pear Storage, 542
Magness, J. R.: See Hawkins, L. A.
Magness, J. R.: See Lewis, C. I.
Magnus, F.: See Myttenaere, F. de
Magnus, R.: Gas Poisoning, 281
Magnus, R.: See Kleijn, A. de
Mágocsy-Dietz, S.: Leaf Adaptation, 290
Mahdihassan, S.: See Fowler, G. J.
Mahnert, A.: Blood Volume in Pregnancy, 215, 385; Endocrine Disturbances, 75
Maier, M., and Lion, H.: Endolymph Movements, 125
Maignon, G.: Glycogen and Seasons, 266
Maigre, E.: See Heymans, C.
Maigre, E.: See Koskowski, W.
Maisin, J.: Antibodies, 90
Malaquin, A.: Reproduction, 77
Malengreau, F.: Vitamins, 508
Mall, F. P., and Meyer, A. W.: Embryology, 641
Malmy, M.: See Richard, F.
Malone, J. Y.: See Sachs, E.
Maltaner, F., and Hoppe, E.: Osmosis and Chemotaxis, 19, 35
Mammele, H.: See Freudenberg, E.
Manaresi, A.: Peach Pollen, 160
Mancini, M. A.: Iodoisopropyl Alcohols, 218
Mandelbaum, M.: Serum Component, 156
Mandelbaum, R.: Electrocardiogram, 427
Mangels, C. E.: Potato Flour, 579
Mangels, C. E.: See Gore, H. C.
Mangenot: Alga Starch, 532
Mangenot, G.: Vaucheria Oils, 228
Mangold, E.: Rigor in Muscle, 358; Rigor in Stomach, 359; Starfish Reflexes, 354
Mann, F. C., and Magath, T. B.: Liver and Blood N, 188; Liver and Glycæmia, 207
Mann, F. C.: Liver Removal, 138
Mann, G.: Obituary, 468
Mann, H.: See Hewlett, A. W.
Manning, A. B., and Schryver, S. B.: Gelatin from Ossein, 472
Manoukhin, I. I.: Leucocytolysis, 156
Manquat M.: Phototropism, 242
Mansfeld, G.: Theory of Stimulation, 359
Manwaring, W. H.: Anaphylaxis, 528
Maquenne, L., and Demoussy, E.: Leaf Respiration, 461
Marabotto, F.: Atheroma and Adrenalin, 89
Marage: Threshold of Hearing, 27
Marage, A.: Protection from Sound, 621
Marañon, G.: Diabetes Insipidus and Pituitary, 274
Marassini, A.: Blood-Pressure and Volume, 371
Maresch, R.: Vein Muscle Tissue, 147
Marie, A.: See Levaditi, C.
Marine, D., and Baumann, E. J.: Suprarenal Insufficience, 447
Marinesco, G.: Amaurotic Idiocy, 334; Tactile Corpuscles, 419
Marinesco, G., and Rascanu, Parkinson's Disease, 416
Marke, D.: See Jarno, L.
Markell, E.: See Ramsay, H. J.
Marsh, P. L.: See Newburgh, L. H.
Marshall, C. H.: Trypanosomiasis, 457
Marshall, E. K., and Crane, M. M.: Kidney Secretion, 208
Marshall, E. K., and Williams, J. W.: Mustard Gas, 85
Martin, E. G.: Muscular Efficiency, 487
Martin, E. G., and Wilbur, B. C.: Salt Antagonisms, 176
Martin, E. G.: See Baumberger, J. P.
Martin, J. C.: See Hoagland, D. R.
Martin, W. H.: S and Soil Activity, 291; Potato Scab, 346
Martin, W. H.: See Lipman, J. G.
Martindale, W. H., and Westcott, W. W.: Review, 233
Mary, A. and A.: Oxalate in Sputum, 392
Mashima, T.: Lung Nerves, 489
Mason, E. C.: Benzyl Benzoate, 83; Blood Coagulation, 36; Lead Organic Compounds, 330; Organic Pb Compounds, 388
Mason, E. H.: Ca Absorption, 368
Mason, M. L.: See Larsell, O.
Massaglia, A. C.: Parathyroid, 211, 326; Testis Internal Secretion, 76
Massey, A. B.: See Robbins, W. J.
Mast, S. O.: Light Reactions, 412
Masucci, P.: Amino-Acids, and Tb, 98
Masucci, P., and Saccardi, P.: Lactic Acid of Gastric Juice, 54
Masucci, P.: See Huntoon, F. M.
Matenaers, F. F.: Sulphur Manuring, 602
Mathews, A. P.: Adsorption, 611
Matheu, C. P.: Vitamin B, 436
Mathieu, P.: See Parisot, J.
Matsumura, S.: Toxic Hb, 527; Vascular Constrictors, 501
Matsuno, G.: See Asher, L.
Matsusaki, S., and Kabeda, I.: Triton Poison, 643
Matsuyama, R.: Siamese Twins, 450, 451
Mattaar, T. J. F.: Urea Synthesis by Urease, 352
Mattei, P. de: Coffee Vitamins, 140
Matthews, A. P.: Sugar Tests, 6
Matthews, S. A.: Mg Salts on Heart, 369
Mattick, E. C. V., and Williams, R. S.: Tryptophane, 341
Mattill, H. A.: Milk Vitamins, 434
Mattill, P. M., and others: Gum-Sugar Infusions, 144
Matula, J.: See Samec, M.
Matzdorff, G.: See Opitz, H.
Maue, G.: Rhubarb Poisoning, 199
Maugham, H. J.: See Harris, F. S.
Mauriac, P., and Servantie, L.: Glycolysis, 636
Maver, M. E.: See Amberg, S.

Mavor, J. W.: X-Chromosomes, 479; X Rays on Drosophila, 176
Maxwell, L. A. I.: Kidney and Hyperglycæmia, 142
Maxwell, S. S.: Dog-Fish Responses, 470, 490
Mayendorf, N. v.: Brain, 418; Brain Association System, 123; Word Centre, 305
Mayer, A., and Morel, P.: Œdema Fluid, 627
Mayer, A., and others: Halogenated Sulphur Esters, 154; Poison Gases, 85
Mayer, A.: See Mayer, S.
Mayer, A.: See Samec, M.
Mayer, C.: Yawning, 260
Mayer, K.: See Mattill, P. M.
Mayer, O.: Deafness, 28
Mayer, P.: Ethereal Oil Substitutes, 5
Mayer, S. and A.: Amylopectine, 237
Mayrs, E. B. C.: See Calvert, E. G. B.
Mazé, P.: CO_2 Assimilation, 540; Plant Assimilation, 290
McBain, J. W.: Colloid Electrolytes, 110
McCabe, E. H.: See O'Reilly, L.
McCall, A. G., and Haag, J. R.: Plant Culture, 338; Soil Reactions, 605
McCann, G. F.: See Hess, A. F.
McCann, G. F.: See Pappenheimer, A. M.
McCann, W. S.: Protein after Fast, 66
McCann, W. S., and Barr, D. P.: Calorimetry in Tb, 68
McCarrison, R.: Children's Diet, 57; Fat and Metamorphosis, 579
McCarrison, R.: Review, 292
McCarthy, A. C.: See Stehle, R. L.
McCaskey, G. W.: Basal Metabolism, 203
McClatchie, A. J., and others: Weather and Crops, 398
McClendon, J. F.: Reaction of Intestine, 432; Sea Salts, 199; Vitamins, 435
McClendon, J. F., and Dick, S. M.: Fruit Juice, 203
McClendon, J. F., and others: H-Ion Concentration of Intestine, 54; Fruit Juice, 203
McClendon, J. F., and Sedgwick, J. P.: Spinach and Sea Salt, 199
McClugage, H. B.: See Givens, M. H.
McClure, C. W., and others: Duodenal Contents, 575; Duodenal Enzymes, 373
McClure, W. D.: Citric Acid Estimation, 209
McCollum, E. V., and others: Rickets, 509, 577; Supplementary Protein Values, 374
McCollum, E. V.: See Macdonald, M. B.
McCollum, E. V.: See Shipley, P. G.
McComas, H. C.: See Stratton, G. M.
McCool, M. M., and Millar, C. E.: Soil Solubility, 344
McCool, M. M., and Wheeting, L. C.: Soil Solubility, 345
McCool, M. M.: See Bouyoucos, G. T.
McCrea, E. D.: See Lloyd, D. J.
McCrudden, F. H.: Fish Roe Toxins, 587
McDowall, R. J. S.: Bloodvessel Contraction, 314
McEllroy, W. S., and Pollock, H. O.: N Elimination, 267
McEllroy, W. S.: See Pollock, H. O.
McGillivray, R.: Dry Farming, 464
McGlannan, A.: Blood Pressure in Surgery, 370
McGuigan, H.: Atropine and Heart Rate, 279; Ciliary Ganglion, 3; Hæmorrhage and Sympathetic, 382
McGuigan, H., and Atkinson, H. V.: Hæmorrhage and Sympathetic, 416
McIlvaine, T. C.: See Salter, R. M.
McKay, A. W.: See Ramsay, H. J.
McKellips, G. M., and others: Phosphate of Blood, 368
McKellips, G. M., and Young, I. M. de: Blood Phosphates, 188
McKenzie, D.: Olfaction Theory, 364
McKinlay, C. A.: Stomach Tube Effects, 133
McLean, F. C., and others: Hb and Blood Reaction, 33
McLean, F. T.: Stomata, 231
McLean, J.: Fibrinogen, 12
McLennan, L.: Solium Fungus, 346
McMaster, P. D., and Haessler, H.: Red Marrow in Anæmia, 617
McMaster, P. D.: See Rous, P.
McQueen, J. M.: See Hill, L.
McRostie, G. P.: Bean Disease, 605
McSwiney, B. A.: Respiratory Waistcoat, 136
Mead, S. W.: See Dutcher, R. A.
Meakins, J.: Blood Gases, 49
Means, J. H.: Basal Metabolism, 437
Means, J. H., and others: Blood Gases and Reaction, 157
Means, J. H., and Woodwell, M. N.: Basal Metabolism, 437
Means, J. H.: See Aub, J. C.
Means, J. H.: See Smith, L. W.
Medes, G.: See Smith, E.
Medical Research Council: Nerve Injuries, 23
Meek, W. J.: Vagal Apnœa, 194
Meek, W. J., and Eyster, J. A. E.: Hæmorrhage, 259
Meek, W. J.: See Eyster, J. A. E.
Meier, H. F. A., and Halstead, C. E.: Water Culture, 537
Meier, K., and Krönig, W.: Narcotics and Blood CO_2, 431
Meier, K.: See Rosenthal, F.
Meier, K.: See Straub, H.
Meigs, E. B.: See Tocher, J. F.
Meincke, P.: See Embden, G.
Meiroisky, E.: Plasma Cells, 617
Meisenheimer, J.: Yeast Chemistry, 338
Meissner, O.: Leaf Colour, 160
Meissner, R.: Emphyllin, 453
Melczer, M. v.: Leucocytes and Spleen, 32
Meldolesi, G.: Œsophageal Pulse, 504
Meldolesi, G.: See Frankel, S.
Mellanby, E., and Mellanby, M.: Thyroid and Goitre, 325
Mellanby, E.: Review, 545
Mellanby, J.: Casein and Sodium Carbonate, 111; Caseinogen, 111
Mellanby, M.: Diet and Teeth, 264
Mellanby, M.: See Mellanby, E.
Mello, F. de: Yeasts, 536
Meltzer, S. J.: Superior Cervical Ganglia, 305
Meltzer, S. J., and Auer, J.: Adrenalin on Vessels, 273
Meltzer Number of Proc. Soc. Exp. Biol. and Med.: Review, 466
Menaol, P.: HCN in Plants, 285; Protein Analysis, 239
Menaol, P., and Dowell, C. T.: Sudan Grass, 532
Mendel, K.: Puberty Gland, 585
Mendel, L. B.: See Cowgill, G. R.
Mendel, L. B.: See Mitchell, H. S.
Mendel, L. B.: See Osborne, T. B.
Mendel, L. B.: See Smith, A. H.
Mendenhall, W. L.: Tobacco Smoking, 387
Meneghetti, E.: Arsenic Compounds, 153; Colloidal As Sulphide, 526
Menzies, J. A.: Urea Excretion, 208
Menzies, J. A.: Obituary, 348
Menzies, J. A.: See Atkinson, M.
Merke, F.: Br in Serum, 253

Merkenschlager, F.: Lupin Chlorosis, 543
Merkle, G. E.: See Hartwell, B. L.
Merrill, E. D.: See Brown, W. H.
Mertens, E.: See Führer, H.
Mertz, A., and Rominger, E.: Blood-Sugar in Infants, 270
Messner, E.: See Hess, K.
Mestrezat, W.: Plasma Dialysate, 496
Mestrezat, W., and Janet, M. P.: Kjeldahl Method, 381
Mestrezat, W., and Ledert, S.: Tissue Chlorides, 352
Mestrezat, W.: See Gosset, A.
Metalnikow, S.: Anaphylaxis, 335
Metz, C. W.: Microscopic Method, 294
Metzner, P.: Photodynamic Effects, 176; Spirilla Movements, 231
Meulengracht, E.: Blood Bilirubin, 610
Meyer, A.: Plant Growth, 99; Protoplasm Circulation, 158
Meyer, A.: See Samec, M.
Meyer, A. W.: See Mall, F. P.
Meyer, G. M.: See Levene, P. A.
Meyer, H.: Abderhalden Reaction, 236; Skin Pigment, 556
Meyer, H. H.: Muscle Tonus, 22
Meyer, H. H.: See Fröhlich, A.
Meyer, J.: See Laubry, C.
Meyer, J. de: Electric Currents of Muscle, 120; Electrocardiogram, 570; Muscle Currents, 303
Meyer, K.: Blood Antigens, 598
Meyer, K. H., and Gottlieb-Billroth, H.: Narcosis, 79
Meyer, P.: See Schwartz, A.
Meyer, P. F.: See McClendon, J. F.
Meyer, S.: See Aschenheim, E.
Meyer-Bisch, R.: Water Exchanges, 567
Meyer-Bisch, R., and Basch, E.: Sulphur Injections, 377
Meyer-Bisch, R., and Heubner, W.: Sulphur Injections, 482
Meyer-Bisch, R.: See Heubner, W.
Meyerhof, O.: Carbohydrate and Lactic Acid of Muscle, 118; Lactic Acid of Minced Muscle, 245; Muscle Work and Lactic Acid, 556
Meyer-Ruegg, H.: Ovaries and Uterus, 77
Meyers, J. T.: Sulphur Bacteria, 229
Meysenbug, L. v.: Blood Ca, 510
Michaelis, L.: Review, 292
Michaelis, L.: HCl of Gastric Juice, 54; Indicator Method, 4, 350; Indicator Method for P_H, 237; Invertase, 175
Michaelis, L., and Airila, Y.: Hb Electric Charge, 351
Michaelis, L., and Krüger, R.: Indicator Method, 403
Michaelis, L., and Rothstein, M.: Invertase, 96
Michailesco, G.: Blind Spot, 562
Michalik, R.: See Hahn, A.
Michel, P.: See Morel, A.
Michel, P.: See Mouriquand, G.
Micheli, F.: Bence-Jones Protein, 518
Michiels and Hennes: Maize Flour, 224
Middleton, H. E.: See Moore, C. J.
Miles, W. R.: Standing, 185; Pursuitmeter, 563
Millar, C. E.: See McCool, M. M.
Miller, C. W., and Sweet, J. E.: Bence-Jones Protein, 581
Miller, E. J., and Robinson, C. S.: Peat Nitrogen, 600
Miller, E. M.: See Phemister, D. B.
Miller, J. L., and Williams, J. L.: Fluid Intake and Blood-Pressure, 258
Mills, C. A.: Tissue Coagulins, 187; Tissue Extracts, 332
Mills, C. A., and Guest, G. M.: Fibrin Formation, 567
Mills, C. A., and others: Blood Clotting Extracts, 367
Milroy, T. H.: Blood Reaction, 493
Milroy, T. H.: See Calvert, E. G. B.
Milroy, J. A., and Milroy, T. H.: Review, 544
Milroy, T. H.: See Milroy, J. A.: Review, 544
Minkowski, M.: Fœtal Movements, 182
Minnich, D E.: Chemoreceptors, 177
Minor, J. E.: Cellulose Hydrolysis, 600
Minot, A. S.: See Reiman, C. K.
Minoura, T.: Gonad Grafts and Sex Characters, 214
Mira, F. de, and Fontes, J.: Intestine and Suprarenal, 272
Mirande, M.: Lathyrism, 281, 531
Mirasol, J. J.: Al in Soils, 344
Mirmelstein, V.: See Uhlmann, F.
Mitchell, C.: Alkali Carbonate in Urine, 270
Mitchell, H. S., and Mendel, L. B.: Diets, 623
Mitchell, P. H.: Potassium and Cells, 616
Mitchell, P. H., and Wilson, J. W.: Adsorption of K, 487
Mitscherlich, E. A.: Plant Growth, 99; Plant Yields, 163; Vegetation Experiments, 230
Mittasch, G.: Hermaphrodites, 641
Mittelmann, B.: Sympathetic Sensation, 126
Miura, M.: See Zilva, S. S.
Miwa, M.: Submaxillary Secretion, 503
Miwa, M.: See Tamura, K.
Miyagawa, Y.: Gastric Glands, 53
Miyake, C.: See Nisikado, Y.
Miyamoto, N.: See Kozawa, S.
M'Leod, J. W., and Wyon, G. A.: Bacterial Vitamins, 230
Möhrke, W.: Synergic Narcosis, 452
Moissonnier, S.: See Carnot, P.
Molisch, H.: Plant Ash Structure, 222
Moll, F.: Wood Preservation, 162
Molliard, M.: NaCl on Fungus, 539
Molz, E.: Beet Fungi, 544
Monakow, C. v.: Cerebro-Spinal Fluid, 564
Monakow, V.: B. P. and Kidneys, 45
Mones, G.: See Vernet.
Monserrat, C., and others: Cobra Venom, 220
Montfort, C. R.: Guttation from Zea, 231; Moor Ecology, 231
Mooers, C. A.: See MacIntire, W. H.
Moog, R.: See Desgréz, A.
Moore, A. R.: Lumbricus, C. N. S., 470; Nerve Cord, 411; Starfish Tropisms, 614
Moore, A. R., and Cole, W. H.: Response to Light, 16
Moore, B.: Review, 399
Moore, B., and others: N Fixation, 99
Moore, C. J., and others: Soil Colloids, 600
Moore, C. R.: Hermaphroditism, 214; Gonad Transplants, 328
Moore, J. W.: Mouthpiece, 236
Moore, L. M.: Body Temperature, 378
Moraczewski, V. de, and Lindner, E.: Sugar Injections, 379
Morawitz, P.: Blood Coagulation, 36
Morawitz, P., and Denecke, G.: Anæmia, 570; Œdema, 314
Morel, A., and others: Bones in Scurvy, 437
Morel, P.: See Mayer, A.
Moreland, C. C.: See Edgerton, C. W.
Morgan, G. T., and Cooper, E. A.: Bactericides, 648
Morgan, J. J. B.: Fatigue and Memory, 30
Morgan, L. E.: See Forbes, E. B.
Morgantown, W. M.: See Heyde, H. C. y. d.

Morgenroth, J.: Anæsthesia, 278
Morgulis, S.: Catalase Reaction, 410
Morimoto, Y., and others: Cetacea, 547
Mörner, C. T.: Homogentisic Acid, 613
Morowoka, T.: Choroid Plexus, 421
Morpurgo, B.: Cœliostomy, 581
Morris, J. L., and Deeds, F.: Glycyl Glycine, 174
Morris, N.: See Adams, D. K.
Morse, W.: Red Cell Autolysis, 186; Glycogen and Acids, 406
Mottram, J. C.: See Cramer, W.
Mottram, T. C., and Clarke, J. R.: Radium and Leucocytes, 35
Mottram, J. C.: See Cramer, W.
Mougeot, A., and Petit, P.: Blood Pressure Waves, 371
Moulinier, R.: See Alexandre, R.
Mourgue, R.: Muscle Tone, 618
Mouriquand, G., and Michel, P.: Lemon Juice, 436
Mouriquand, G.: See Morel, A.
Moyle, D. M.: See Foster, D. L.
Mudd, S., and others: Nasal Vasomotor Reactions, 221, 392; Nasal Reactions, 598
Mühlmann, M.: Enzymes, 477
Mühsam, R.: See Loewy, A.
Mukai, G.: Carbon Dioxide on Blood, 568
Mukai, I.: Subconjunctival Injections, 592
Müller, A.: Oxygen and Plankton, 163
Müller, E. F.: Digestion Leucocytosis, 55
Müller, F.: Metabolism at Convalescent Home, 141
Müller, F.: See Häberlin, C.
Muller, P.: See Bergh, H. v. d.
Müller, R.: Wassermann Reaction, 529
Munerati, O.: Cold on Germination, 537
Münter, D. F.: Beet and Soil, 398
Münter, F.: Manuring Beet, 606
Murada, K., and Katsaka, B.: Arteriosclerosis, 597
Murayama, Y., and Aoyama, S.: Earthworm, 299
Murneek, A. E.: See Lewis, C. I.
Murphy, G.: See Burtt, H. E.
Murphy, G.: See Wells, F. L.
Murphy, J. B.: See Nakahara, W.
Murray, C. D.: See Hastings, A. B.
Murray, H. A.: See Hastings, A. B.
Murray, H. A.: See McLean, F. C.
Murray, J. A., and Woglom, W. H.: Tar Cancer, 598
Murschhauser, H.: Dextrose Rotation, 473; Mutarotation, 350; Sugar Estimation. 350; Sugar Feeding, 442
Musante, L.: See Funaro, A.
Musumeci, G., and Macco, G. Di: Perspiration, 210
Myers, M. M., and White, P. D.: Interpolated Heart Beats, 257
Myers, V. C., and Croll, H. M.: Vegetable Carbohydrates, 318
Myers, V. C., and Killian, J. A.: Kidney and Drugs, 590; Uric Acid and Drugs, 208
Myers, V. C., and others: Phenylcinchoninic Acid, 81
Myers, V. C.: Review, 168
Myers, V. C., and Short, J. J.: Blood K, 568; K of Blood, 130
Myrbäck, K.: See Euler, H. v.
Myttenaere, F. de: Composition of Galyl, 388
Myttenaere, F. de, and others: Arsenobenzenes, 281

Naccarati, S.: Hormones and Emotions, 383
Nadolny, G.: Blood Sedimentation, 564
Nagao, K.: Injection of Indian Ink, 367
Nagagawa, S.: Tissue Proteases, 477
Nagahashi, M.: See Barcroft, J.
Nagayama, T.: Tissue Lipoids, 470; Pyruvic Acid and Moulds, 533
Nägeli, C.: See Karrer, P.
Nageotte, J.: Corneal Nerves, 20
Nakagawa, K.: Alcohol Narcosis, 452
Nakahara, W., and Murphy, J. B.: Lymphoid Germ Centres, 356
Nakamura, B.: Retinal Colour, 307
Nakamura, H.: Internal Secretions, 75; Oxygen Use of Muscle, 316
Nanji, D. R.: See Ling, A. R.
Narigawa, S.: Infantile Diabetes Insipidus, 73
Nash, T. P., and Benedict, S. R.: Blood NH_3, 626
Nåslund, J.: Corpus Luteum, 150
Nassau, E.: See Fränkel, S.
Nasta, M.: See Ionesco, D.
Nattrass, F. J., and Sharpe, J. S.: Tetany, 446
Neal, H. V.: Plasmodesma, 121
Neal, H. V.: See Cook, M. H.
Negelein, E.: See Warburg, O.
Neidig, R. E., and others: Sunflower Silage, 507
Neill, A. J.: Diffusion Experiments, 549
Neill, A. J.: See Nice, L. B.
Neilson, C. H., and Wheelon, H.: Red Cell Resistance, 309, 422
Nellans, C. T.: See Underhill, F. P.
Neller, J. R.: Limed Soils, 343
Nelson, C. F., and Kinney, M.: Metabolism of N, 204
Nelson, E. M.: See Steenbock, H.
Nelson, G. M.: See Steenbock, H.
Nelson, J. B.: See Atkinson, A.
Nelson, V. E., and others: Yeast Vitamins, 202; Yeast Vitamin B, 289
Němec, A., and Duchon, F.: Phosphatase, 533
Němec, A., and Kás, V.: Se on Moulds, 229
Nemet, G.: See Katsch, G.
Nepveux, F.: Bacterial Pigments, 229
Nepveux, F.: See Labbé, M.
Neuberg, C., and Arinstein, B.: Butyric Ferment, 533
Neuberg, C., and Cohen, C.: Acetaldehyde in Fermentation. 646
Neuberg, C., and Hirsch, J.: Carboligase, 160
Neuberg, C., and Liebermann, L.: Carboligase, 478; Sugar Sulphuric Esters, 473
Neuberg, C., and others: Fermentation, 534; Fermentation Catalysts, 646
Neuberg, C., and Ursum, W.: Fermentation, 96
Neuffer, H.: Hæmophilia and Spleen, 80
Neukirch, B.: See Boden, E.
Neuschlosz, S. M.: Ion Antagonisms, 110
Nevens, W. B.: See Hamilton, T. S.
Newburgh, L. H.: See Squier, T. L.
Newburgh, L. H., and Marsh, P. L.: Diabetic Diet, 51; Fat Diet in Diabetes, 380
Newcomer, H. S.: Gas Apparatus, 403
Newcomer, H. S.: See Gasser, H. S.
Newman, H. H.: Twins and Monsters, 299
Niccolini, P. M.: Emetine, 331
Nice, C. M.: Heart Disease and Thyroid, 74
Nice, L. B., and Neill, A. J.: Diaphragm Tone, 415, 416; Diaphragm Tonus, 181
Nichols, H. J.: Disodium Ethyl Arsenite and Spirochætes, 282
Nicholson, S. T.: See Blau, N. F.
Nicloux, M.: CO in Blood, 425
Nicloux, M., and Welter, G.: Organic Iron, 295
Nielsen, C., and Higgins, J. A.: Benzyl Esters, 331
Nielsen, F.: Graafian Follicle Ripening, 450; Ovary and Uterus, 384
Nifterik, C. H. M. v.: See Bruyn, E. M. M.
Nilsson-Ehle, H.: Heredity Problems, 166
Nirenstein, E.: See Dalyell, E. J.

Nishida, T.: Gold on Phagocytosis, 480
Nisikado, Y., and Miyake, C.: Rice Seeds, 607
Noack, K.: Temperature and Fungi, 229; Light Catalysis, 458
Nobel, E.: Heated Milk, 511
Noel, R.: Liver Mitochondria, 301
Noferi, U.: See Brunacci, B.
Noguchi, H.: Protein in C.S. Fluid, 127
Noica: Aphasia, 418
Nolf, P.: Blood Coagulation, 36; Fibrinogen and $CHCl_3$, 187; Plasma Clotting, 567; Serum Thrombin, 367; Thrombozyme, 254
Nolte, O.: Manures, 602
Nomura, S.: Pepsin in Urine, 381
Nonnenbruch: Urea Administration, 311
Nonnenbruch, W.: Gum Saline Infusion, 568
Nonnenbruch, and Szyszka, W.: Coagulation Hastener, 279; Spleen and Blood Clotting, 36
Noorden, C. v.: Diabetes and War Food, 51
Nordefeldt, E.: Emulsion, 352
Nordenson, J. W.: Reaction of Aqueous Humour, 561
Nordhausen, M.: Transpiration, 164
Noriega, E.: Nitrification, 543
Nörr, J.: Fœtal Electrocardiogram, 255; Ox Electrocardiogram, 256
Norris, F. W.: See Clayson, D. H. F.
Northrop, J. H.: Gelatin Hydrolysis, 472; H-ion Activity, 404; Pepsin Action, 551
Nothmann, M.: Ca and Muscle, 557
Nothmann, M.: See Frank, E.
Noüy, P. L. du: Vision, 419
Noüy, P. L. du: See Carrel, A.
Nowrey, J. E.: See Hammett, F. S.
Noyes, H. A.: Frozen Soil Bacteria, 104
Noyes, H. A., and Grounds, G. L.: Soil Bacteria, 104
Noyes, H. A., and others: Petri Plate Incubation, 98
Noyes, H. A., and Weghorst: Roots and CO_2, 103
Noyes, H. M.: See Eckweiler, H.
Nürnberger, L.: Leucocytes, 424; X Rays and Uterus, 80
Nye, L. L.: See Jones, M. R.
Nye, R. N.: See Lord, F. T.
Nyffenegger, W.: See Asher, L.

Obreshkove, V.: Light Reactions, 402
Ochoterena, I., and Ramirez, E.: Interstitial Cells of Ovary, 74
O'Conor, V. J.: See Wislocki, G. B.
Oddo, B., and Pollacci, G.: Chlorophyll and Pyrrole, 222
Odén, S.: Humic Soils, 543
O'Donnell, W. S.: See Greenthal, R. M.
Oehlkers, F.: Plant Curvatures, 165
Oehme, C.: Water Diuresis, 323
Oesterlin, E.: See Russ, V. K.
Oettingen, K. v.: Blood Sedimentation, 366
Oettingen, K. v.: See Sachs, H.
Ogata, D.: Heat Tachypnœa, 142: Nystagmus, 125
Ogata, S.: Isolated Uterus, 592
Ogawa, C.: Ear Vesicle, 363; Japanese Parotid, 197; Lens Regeneration, 305
Ohara, H.: Spleen Juice Injection, 497
Ohlsson, E.: Succinodehydrogenase, 414
Ohm, R.: Third Heart Sound, 369
Öhrwall, H.: Sensation, 492
Oka: Autolysis of Cell Granula, 355
Okamoto, S.: Drugs on Uterus, 384
Okubo, N.: Enteritis, 596
Okuda, Y., and Zoller, H. F.: Whey Coagulation and Reaction, 612
Olivecrona, H.: Histamine and Peptone on Intestine, 262
Oliver, J.: Menstrual Fluid, 77; Urea Excretion Mechanism, 145
Olmsted, J. M. D.: Lingual Nerve Section, 307
Olsen, C.: Soil Reactions, 605
Olsson, U.: Amylase Poisons, 477, 613
Onohara, K.: Blood Sugar, 440
Onslow, H.: Casein Hydrolysis, 407; Insect Scales, 411; Tryptophan, 406; Wing Colour in Lepidoptera, 15
Onslow, M. W.: Oxidising Enzymes, 287
Oort, H.: Macula Acustica, 28
Opitz, H., and Matzdorff, G.: Blood-Clot Retraction, 254
Opitz, R. B.: Review, 106
Oppenheimer, B. S., and Pardee, H. E. B.: Heart-Block, 42
Oppenheimer, B. S.: See Hewlett, A. W.
Oppenheimer, C.: Review, 233
Oppenheimer, E.: Bromide Estimation, 333
O'Reilly, L., and McCabe, E. H.: Vegetable Carbohydrate, 199
Orr, J. B., and Kinloch, J. P.: Diet and Work, 141; Respiratory Calorimetry, 438
Osborne, E. D.: Iodine in C.S. Fluid, 308
Osborne, O. T.: Endocrine Disturbances, 582
Osborne, T. B., and Mendel, L. B.: Carbohydrate and Growth, 262; Fat-Poor Diets, 56; Ophthalmia, 201; Protein Diets, 318
Osborne, W. A.: Blood-Pressure Regulation, 193; Surface Phenomena, 172
Oshima, K., Diastase Estimation, 94
Ossart, Mlle.: See Berthelot, A.
Osterberg, E.: See Benedict, S. R.
Ostlund, E. O., and others: Heat-Block of Sciatic, 559
Ostlund, E. O.: See Dawson, P. M.
Osugi, S.: Acid Salts, 606
Otsuka, I.: Tyrosine Derivatives, 226
Otsuka, I.: See Sasaki, T.
Ottenberg, R.: Blood Groups, 497
Ottenstein, B.: See Thannhauser, S. J.
Ottow, B.: See Lipschütz, A.
Overholser, E. L., and Taylor, R. H.: Fruit Ripening, 101
Overholser, E. L.: See Cruess, W. V.
Owen, D. R.: See Adrian, E. D.
Owen, R. G.: Lactose Estimation, 6
Oyama, Y.: See Ivy, A. C.
Ozaki, Y.: Nerves and Drugs, 592

Paassen, P. v.: Ca-ions in Spasmophilia, 488
Pacchioni, D.: Infant Respiration, 572
Pacella, G.: See Guglielmetti, J.
Pachon, V., and Fabre, R.: Blood-Pressure, 258, 629
Pagniez, P.: Leucocytes and Circulation, 565
Paillot, A.: Immunity in Insects, 115, 116
Paine, A., and Peyron, R.: Experimental Sarcoma, 20
Paine, S. G., and Berridge, E. M.: Bacteriosis, 398
Painter, T. S.: Reptilian Spermatogenesis, 585; Spermatogenesis, 640
Palmer, A. H.: Fires by Lighting, 343
Palmer, L. S., and Kennedy, C.: Carotinoids and Albinos, 319
Palmer, W. W., and others: Urine and Plasma after $NaHCO_3$, 63; Osmotic Pressure, 404
Palmer, W. W.: See Jackson, H.
Palmer, W. W.: See Ladd, W. S.
Palsberg, M.: See Jacobsen, A. T. B.
Palugyay, J.: Cardia, 197
Panajotakos, P.: Lactacidogen, 484

Panconcelli-Calzia, G.: Review, 233
Panelius, A.: See Apajalahti, A.
Panisset, L.: See Porcher, C.
Pannett, C. A., and Wilson, C. M.: Bile and Stomach, 198
Paolucci, R.: Anti-Bacterial Substances, 529
Pappenheimer, A. M.: See Sherman, H. C.
Pappenheimer, A. M., and others: Rickets in Rats, 510
Pappenheimer, A. M.: See Hess, A. F.
Parat, M.: Embryo Intestine, 317
Pardee, H. E. B.: See Oppenheimer, B. S.
Parhon, M.: Glycogen after Thyroidectomy, 379
Pari, G. A.: Spinal Sweat Centres, 26; Sweat Innervation, 325
Parisot, J., and Mathieu, P.: Pituitary Extracts, 73
Park, E. A., and Howland, J.: Cod-Liver Oil, 577
Park, E. A.: See McCollum, E. V.
Park, E. A.: See Shipley, P. G.
Parker, F. W., and Truog, E.: Ca : N Ratio in Plants, 340
Parker, G. H.: Locomotion of Stichopus, 176; Octopus Suckers, 299
Parnas, J. K.: Carbohydrate Exchange, 485; Water Exchange, 210
Parnas, J. K., and Laska-Mintz, E.: Muscle Metabolism, 485
Parrisius, W.: Skin Capillaries, 571; Sweat Ducts, 210
Parsons, H. T.: See McCollum, E. V.
Parsons, T. R.: Blood-Gas Apparatus, 294
Parsons, T. R.: See Shearer, C.
Parthasarathy, M. O. P.: Volvocaceæ, 99
Partington, J. R., and Huntingford, D. B.: Osmic Acid and Fats, 238
Passerini, N.: Vinegar Eel, 402
Pastore, S.: Starch Digestion, 317
Patania, G.: Alcohol on Heart, 428
Pathak, G. J.: Famine Foods, 200
Paton, D. Noël, and others: Review, 292
Paton, D. N.: Institutes of Medicine, 1; Rickets, 201
Paton, D. N., and Watson, A.: Rickets, 201
Paton, D. N.: See Findlay, L.
Paton, D. N.: See Gribbon, M. R.
Patschowsky, N.: Oxalic Acid in Plants, 393; Plant Defence Substances, 158
Patten, M. W.: Amicronucleate Didinium, 298
Patterson, T. L.: Lungs and Vagus, 630; Lung Motor Mechanism, 194; Stomach Movements, 198
Patty, F. A.: HCN by Bacteria, 397
Paul, J.: Saccharin, 30
Paulesco: Pancreatic Extract, 442
Paulesco, N.: Glycogen in Diabetes, 51
Paulesco, N. C.: Pancreas Functions, 580
Pavlov, I. P.: Hunger Centre, 559
Pavlovsky, A. T.: Lymphocytosis and Digestion, 55
Paychère, A.: See Dorlencourt, H.
Peabody, F. W., and others: Adrenalin and Hyperthyroidism, 274
Peabody, F. W., and Sturgis, C. C.: Vital Capacity, 630
Pearce, R. G.: Cardio-Respiratory Mechanism, 136; Second Wind, 197
Pearl, R., and Fairchild, T. E.: Fowl Feeding, 328
Pearl, R., and Schoppe, W. F.: Fowl Reproduction, 385
Pearl, R.: See King, J. T.
Pearsall, W. H.: Lake Vegetation, 103
Pearson, C. E.: See Greenish, H. G.
Pearson, K.: Address to B. A.: 1
Pech, J. L., and Quinquaud, A.: Differential Pulse, 429
Peddie, W.: Fechner's Law, 306
Pedersen, V. O.: Phenolsulphonephthalein in Urine, 64
Pedotti, F.: Calcium and Basal Metabolism, 636
Peiper, A.: See Schiff, E.
Peiser, E.: See Steudel, H.
Pellegrini, R.: Blood and Intestine Tone, 582
Pellini, E. J.: See Wallace, G. B.
Pelous, L. A.: Osmotic Phenomena, 7
Pember, F. R.: See Hartwell, B. L.
Pembrey, M. S.: See MacKeith, N. W.
Penau, H., and Simonnet, H.: Yeast and Vitamin B, 375
Penfield, W. G.: Golgi Apparatus, 355; Ureter Contraction, 380
Penfold, W. J.: Red Cell "Refusion," 253
Pentimalli, F.: Pituitary and Diuresis, 383; Protein Intoxication, 595
Perander, H.: See Lundgren, R.
Perdrau, J. R.: Silver Method, 21
Pérez, C.: Testis Interstitial Tissue, 329
Perrett, W.: Resonance Theory, 250
Perrin, F. A. C.: See Burtt, H. E.
Perrot, E., and Lecoq, R.: Vitamins, 508
Perry, E. E.: See Baumberger, J. P.
Perrycoste, F. H.: Coloured Thinking, 127
Pesci, E.: Anaphylaxis, 392
Peter, A. M.: See Buckner, G. D.
Peterfi, T.: Urogenital Diaphragm, 523
Peters, A. T.: Mineral Requirements, 375
Peters, A. W., and Guenther, A. E.: Muscular Atrophy, 181
Peters, A. W., and Rubnitz, A. S.: Anæmic Blood, 49
Peters, J. P., and Barr, D. P.: Blood CO_2, 47
Peters, J. P., and others: CO_2 of Blood, 135
Peters, J. P.: See Barr, D. P.
Peters, R. A.: Colpidium Culture, 298; Goat-Urine Sampling, 66
Petersen, W. F., and Saelhof, C. C.: X-Ray Stimulation, 217
Peterson, A.: Aphis Eggs, 354
Peterson, W. H.: See Fred, E. B.
Petit, P.: See Mougeot, A.
Petow, H.: See Rona, P.
Petry, E.: X Rays on Seeds, 542
Pettersson, A.: See Euler. H. v.
Peyron, A.: See Paine, A.
Peyronel, B.: Blepharospora Terrestris, 168
Pézard, A.: Testis and Sex Characters, 75, 76
Pézard, A.: See Gley, E.
Pezzi, C.: See Clerc, A.
Pfahl: Reciprocal Innervation, 358
Pfaundler, M.: Surface Area and Metabolism, 376
Pfaundler, M., and Schübel, K.: Milk Digestion, 523
Pfeiffer, H.: Protein Toxicosis, 158
Pfeiffer, H., and Bayer, G.: Light Catalysis, 423
Pfeiffer, T., and Rippel, A.: Ca and Mg for Plants, 230; Ca and Mg in Plants, 602; Ca, Mg, and Plant Growth, 163
Phares, V. R.: See Carr, R. H.
Phemister, D. B., and others: P in Rickets, 219
Philibert: Urine Nitrogen, 471
Philippson, M.: Electrical Resistance of Tissues, 18; Thermionic Valve, 609; Tissue Conductivity, 116; Tissue Resistance. 609
Philippson, M., and Hannevart, G.: Action of Acids, 22, 119
Philips, A. G., and others: Chicken Feeding, 435
Physiological Reunion, Dutch, 1
Piazza, V. P.: Phenolipoids, 279
Pic, A., and others: $CaCl_2$ and Strychnine, 390

Piccioli, L.: Moss Hygroscopy, 159
Piccoli, S.: Placenta Biology, 150
Pick, E. P.: Heart Poisons, 80
Pick, E. P.: See Kolm, R.
Pictet, A.: Sugars, 600
Pierce, H. F.: See Dreyer, G.
Piéron, H.: Tendon Reflexes, 248; Visual Latent Period, 306; Visual Stimuli, 363
Pierson, E. M., and Dutcher, R. A.: Rhubarb as Antiscorbutic, 60
Piettre, M., and Vila, A.: Serum Proteins, 610
Pighini, G.: Brain Chemistry, 491; Brain in D. præcox, 183
Pike, F. H.: See Hastings, A. B.
Ping, C.: Sympathetic Cell Growth, 361; Sympathetic Ganglion, 489
Pinkhof, J.: After-Contraction, 417
Pinner, M.: Thymus Cells, 212
Pipal, F. J.: Barberry and Wheat-Rust, 104
Pittarelli, E.: Acetonuria, 146; Formaldehyde Test, 271; Lactic Acid in Stomach, 137
Plagge, H.: Alkyl Chlorides and Yeast, 533
Plahl, W.: Oxalate in Plants, 223
Plant, O. H.: Carminatives, 83
Plantefol, L.: See Mayer, A.
Plattner, F.: Reflex in Frog, 489
Plaut, R.: Respiration of New-Born, 315
Plimmer, R. H. A.: Nutrition, 199; Protein in Nutrition, 374
Plimmer, R. H. A.: Review, 399
Plummer, H. S.: Thyroid and Thyroxin, 446
Plummer, H. S., and Boothby, W. M.: Thyroxin, 211
Plymen, F. J.: See Clouston, D.
Pohlmann, J.: Polypeptides, 475
Polack, A.: Chromatic Abberration, 363
Polettini, B.: Platelets, 496
Poll, H.: Hermaphrodites, 641
Pollacci, G.: See Oddo, B.
Pollitzer, R.: Gastric Juice of New-Born, 573
Pollock, H. O., and McEllroy, W. S.: N Elimination, 208
Pollock, H. O.: See McEllroy, W. S.
Polonowski, M., and Duhot, E.: Sugar Estimation, 403
Pomaret, M.: Novarsenobenzol Injection, 280
Pond, S. E.: Contraction Wave, 415
Ponder, E.: Bile Salts and Hæmolysis, 625; Hæmolytic Action, 598; Hæmolytic Substances in Urine, 445; Hæmolytic Urines, 63
Ponder, E., and Howie, L.: Blood-Sugar Estimation, 269
Poole, J. H. J.: Vision Theory, 561
Popper, E.: Patellar Reflex, 23
Porak, R.: Adrenalin Action, 72
Porcher, C., and Chevalier, A.: Milk Salts, 386
Porcher, C., and others: Rennet, 318
Porcher, C., and Panisset, L.: Colostrum, 61
Porcher, C., and Tapernoux, A.: Lactose Injection, 378
Porsild, A. E.: Arctic Seeds, 532
Portes: See Galavielle.
Portes, F.: See Grynfeltt, E.
Portier, P.: Vitamins, 435
Portier, P.: See Lopez-Lomba, J.
Portier, P., and Rorthays, R. de: Sex Characters, 449
Pottenger, F. M.: Sympathetic and Parasympathetic, 271
Potter, M. C.: Electrical Signs, 547
Potts, F. A.: Vital Staining, 242
Potts, W. A.: Mental Tests, 127
Powers, E. B.: Conductivity and Toxicity, 219
Pozerski, E.: Papaine, 226; Papaine Action, 112; Revolution of Dogs, 563
Prados (=Prados y Such), M.: Polymorphic Nerve Cells, 26
Prados, M.: See Lafora, G. R.
Prakken, J. R.: Œsophagus Movements, 260
Prankert, T. L.: Statocysts in Wheat, 101
Pratt, D. J.: Cycloloma Cells, 336
Pregl, F.: As Estimation, 296
Prell, H.: Plant Movements, 541
Prewitt, P. V.: Spinal Cat Reactions, 491
Pribram, H., and Eigenberger, F.: Stalagmones, 209
Pribram, H., and Herrnheiser, G.: Non-Dialysable Urine Fraction, 63
Price-Jones, C.: Red Cells in Emphysema, 366
Priesel, A.: Pituitary Dwarf, 640
Priestley, J. H.: Suberin and Cutin, 286
Priestley, J. G.: Water Excretion, 581
Prigosen, R. E.: Cell Granules, 357
Prince, A. L.: Hb and CO Affinities, 48; Otic Labyrinth, Nystagmus, and Labyrinth, 28
Pringle, J. H., and Teacher, J. H.: Auto-Digestion of Œsophagus, 52
Pringsheim, E. G.: Gelatin Light Filters, 159
Przibram, H.: See Bierens de Haan, J. A.
Puntoni, V.: Tobacco Smoke, 524
Putkonen, T.: See Lundgren, R.
Putnam, T. J.: See Wislocki, G. B.

Quagliariello, G.: Hæmocyanine, 12; Muscle Chemistry, 303; Serum Nitrogen, 38; Submaxillary Gland Stimulation, 52
Quantmeyer, H.: See Autenrieth, W.
Quereau, F. C.: Salt and Rice Growth, 346
Querido, A.: Reaction Processes, 365
Quigley, J. P., and Hirschfelder, A. D.: Phenyl Carbinols, 387
Quinquaud, A.: See Gley, E.
Quinquaud, A.: See Pech, J. L.
Quisumbing, F. A.: Dextrose and Starch Estimation, 5
Quix, F. H.: Otolith Functions, 363, 562

Raap, G.: See Mills, C. A.
Rabak, F.: Wormwood Oil, 600
Rabak, F.: See Shrader, J. H.
Rabaut, C., and Stillmunkés, A.: S in Urine, 471
Rabaud, E.: Spider Instinct, 15; Tropisms and Tone, 552
Rabe, F., and Salomon, E.: Hæmophilia, 37
Radasch, H. E.: Bone Organic Matter, 244
Radin, M. J.: See Crohn, B. B.
Rado, W.: Albumin in Urine, 445
Ragsdale, A. C.: See Brody, S.
Raistrick, H., and Clark, A. B.: Bacterial Cycloclasis, 287
Raiziss, G. W., and Falkov, M.: Neoarsphenamine, 220
Raiziss, G. W., and others: Chemotherapy of As, 281
Ralston, G. S.: See Kraus, E. G.
Ramalho, A. S. M. M.: Intrahepatic Pancreas, 178
Ramberg, L.: As Estimation, 296
Raminez, E.: See Ochoterena, I.
Rammelt, G.: See Strauss, H.
Ramsay, H. J., and others: Apple Storage, 463
Rancken, D.: Body Temperature in Exercise, 68; Metabolism in Work, 578; Muscle Efficiency, 416
Rand, G.: See Ferree, C. E.
Ranedo, J.: See Cano, J. M.
Ransom, F.: See Dixon, W. E.
Ranson, S. W.: Review, 168
Ranson, S. W.: Visceral Reflexes, 620

Raper, H. S.: Enterolith, 90, 222
Rapoport, F. H.: See Barbour, H. G.
Rappini, M.: Muscular Sense, 308
Rapport, D.: See Cannon, W. B.
Rascanu: See Marinesco, G.
Rasmussen, A. T.: Pituitary of Woodchuck, 148
Rasznyák, S.: Blood Chloride, 39
Rathery, F.: See Bierry, H.
Rathery, F.: See Carnot, P.
Ravaut, P., and Boyer, L.: Albumin in C.S. Fluid, 564
Ravenna, C.: Starch Formation, 164
Ravenna, C.: See Ciamician, G.
Rawes, A. N.: Pollination of Plums, 462
Ray, C. B.: See Shorten, J. A.
Raybaud, L.: Euphorbia Gum, 223
Raymond: See Pic, A.
Reach, F.: Bile Sphincter, 576
Read, B. E.: Eunuch Metabolism, 267
Read, J. W.: Soil Carbon, 600
Rebello, S.: Fluorescent Action, 227
Redfield, A. C., and Bright, E. M.: Radiation on Nereis Eggs, 298
Reed, H. S.: See Harris, J. A.
Rehfuss, M. E., and Hawk, P. B.: Gastric Analysis, 136
Rehfuss, M. E.: See Lermann, W. W.
Reichert, F., and Trelles, R. A.: As in Soil, 464
Reid, W. D.: Auricular Sounds, 192
Reijs, J. H. O.: Dynamometric Experiments, 245; Movement, 557; Muscular Tone, 245; Rhythm and Pulse-Rate, 258
Reiman, C. K., and Minot, A. S.: Manganese Ingestion, 84
Reimann, H. A.: See Reimann, S. P.
Reimann, S. P., and others: CO_2 after Anæsthesia, 152
Reimann, S. P., and Reimann, H. A.: Bicarbonate Administration, 330
Reimann, S. P., and Sauter, M. D.: Bicarbonate Injections, 330
Reinau, E.: CO_2 as Manure, 100; Plant Metabolism, 227; Sunlight, 222
Reiner, L.: See Bechhold, H.
Reinfurth, E.: See Neuberg, C.
Reinheimer, H.: Symbiosis, 469
Reinicke, D.: See Rona, P.
Reinle, H.: Enzymes and Light, 216
Reiss, F.: Iron and Milk Tests, 277
Reiss, J.: See Crohn, B. B.
Reissner, A.: Thiocyanate in Saliva, 631
Reist, S. H.: Blood Sugar, 404
Reitler, R.: See Hess, L.
Rejtö, A.: Labyrinth Tone, 125
Renauld-Capart, H.: Brain and Liver, 305; Cerebral Metabolism, 24; Liver and Brain Metabolism, 122
Renaux, E.: Albumin in Urine, 381; Wassermann Reaction, 90, 91
Renqvist, Y.: Taste Threshold, 29
Renshaw, R. R.: Mice Feeding, 507
Retterer, E., and Voronoff, S.: Testis after Vasectomy, 384
Rettger, L. F., See Cheplin, H. A.
Rettie, T.: See Smith, J. L.
Reuter, I.: Creatinine, 16
Rexhausen, L.: Mycorrhiza Physiology, 158
Reychler, A.: Starch, 533
Reymann, G. C.: Antibodies from Mother, 130
Reyner, C. E.: Nitrogen Estimation, 548
Reynolds, E., and Macomber, D.: Diet and Sterility, 437
Reynolds, L.: See McClure, C. W.
Rhode, H.: Local Anæsthesia, 590
Rhodehamel, H. W., and Stuart, E. H.: Atropine from Datura, 600
Ribeyrolles, A. B.: Intestinal Obstruction, 456
Ribot, A.: See Achard, C.
Rice, W. H.: Fruit Storage, 464
Rich, A. R.: Capillaries in Histamine Shock, 156
Rich, K. B.: Nutrition in Schools, 204
Richard, F., and Malmy, M.: Adrenaline Preservation, 584
Richard, G.: Amyl Nitrite, 332
Richaud, A.: Poison Gas and Kidneys, 144
Richaud, A.: See Clogne, R.
Richet, C.: Heat Stroke, 589; Heat Tolerance, 609; Speed Illusion, 563
Richet, C., and others: Anaphylaxis, 392; Anaphylaxis in Bacteria, 155
Richter-Quittner, M.: Blood Cholesterol, 189; Ca Distribution in Blood, 254; Calcium of Blood, 189; Colloid Swelling, 472
Richter-Quittner, M.: See Falta, W.
Richter-Quittner, M.: See Hitzenberger, K.
Ricôme, H.: Branch Orientation, 290
Riddle, O.: Oxygen and Embryos, 150
Riddle, O., and others: Reproduction in Birds, 522
Riddoch, G.: Sensory Impulses from Bladder, 126
Riedel, R.: Casein Parenteral, 11
Riess, L.: Platelets, 495
Riesser, O.: Rabbit Muscle, 485
Ringer, M., and Underhill, F. P.: Protein Effects, 635
Ringer, W. E.: Trypsin, 478
Rippel, A.: Barometer and Fermentation, 160; Chemistry of Twigs, 396; Plant Growth, 160
Rippel, A.: See Pfeiffer, T.
Riquier, G. C.: Nerve Fasciculi, 121
Ritter, N.: Astragalus Cells, 336
Rivera, V.: Crop Yield, 230
Rivers, W. H. R.: Instinct and Unconscious, 126
Roaf, H. E.: Barfoed's Reagent, 170; Chatelier Theorem, 172
Roaf, H. E.: Review, 466
Robb, E. F.: Ca Metabolism and Vegetables, 141
Robbins, H. L., and Child, C. M.: Regeneration, 15
Robbins, W. J., and Massey, A. B.: Vanillin and Soil Bacteria, 344
Roberts, Ff.: Adrenaline on Respiration, 584
Roberts, R. H.: Apple Fruit Spurs, 166
Robertson, T. B.: Cell Multiplication, 614
Robertson, T. B.: Review, 399
Robinson, A.: Prenatal Death, 169
Robinson, C. S.: Insoluble Carbohydrates, 338
Robinson, C. S.: See Miller, E. J.
Robinson, E. S.: See Winternitz, M. C.
Robinson, G. C.: See Feil, H. S.
Robinson, R. H.: Acid Soils, 543
Robinson, R. H., and Bullis, D. E.: Acid Soils, 543
Robison, R.: See Harden, A.
Robitschek, W., and Turolt, M.: Bile Secretion, 433
Robscheit, F. S.: See Whipple, G. H.
Roca, J.: Pituitary Components, 585
Roca, J.: See Lamson, P. D.
Rochaix, A.: See Cluzet, J.
Rockwood, E. W., and Khorozian, K. G.: Pentose, 200; Xylose Utilisation, 318
Roelofs, C. O.: Visual Attention, 250
Roger, H.: Kidney and Vagus, 591
Roger, H., and Binet, L.: Succus Entericus, 506
Rogers, F. T., Blood-Pressure Maintenance; 183; Sympathetic, 183; Vaso-Motor Centres, 25
Rogers, F. T., and Wheat, S. D.: Brain and Metabolism, 490

Rogers, F. T., and Bercovitz, Z.: Stomach Innervation, 373
Rogers, F. T.: See Bercovitz, Z.
Rogoff, J. M., and Goldblatt, H.: Blood in Goitre, 582
Rogoff, J. M.: See Stewart, G. N.
Rohden, K. v.: Ultra-Violet on Red Cells, 33
Rohdenburg, G. L.: Glycæmia and Tumours, 380
Rojas, P.: Glycogen in Heart, 554
Rolf, I. P.: See Levene, P. A.
Rollier, A.: Heliotherapy, 151
Rolly: Respiratory Exchange, 195
Romeis, B.: Thymus Feeding, 212
Romeis, B., and Dobkiewicz, L. v.: Thyroid on Invertebrate, 70
Romieu, M.: Cœlomic Corpuscles, 552
Rominger, E.: See Eckstein, A.
Rominger, E.: See Mertz, A.
Rona, P.: Gas Poisoning, 281
Rona, P., and Bach, E.: Nitrophenols and Invertase, 391; Serum Lipase and Atoxyl, 14
Rona, P., and Bloch, E.: Quinine and Invertase, 391; Quinine in Blood, 524
Rona, P., and György, P.: Urease, 14
Rona, P., and Petow, H.: Thioglycol and Urease, 14
Rona, P., and Reinicke, D.: Quinine and Lipase, 391
Ronca, V.: Liver Excision in Frog, 576
Rondoni, P.: Melanin from Pyrrole, 174; Pyrrol and Melanuria, 351
Ronzone, E.: See Schlomowitz, H. H.
Roos, J.: Psychogalvanic Reflex, 421
Roos, J.: See Einthoven, W.
Root, H. F.: See Gray, H.
Root, L. E.: See Lewis, H. B.
Rorthays, R. de: See Portier, P.
Rose, A. R.: Sucrose Estimation, 296
Rose, D. H., and others: Salts and Oxidases, 96
Rose, R. C.: See Rose, D. H.
Rose, W. C.: Purine Metabolism, 635
Rosenau, M. J.: Milk Vitamins, 386
Rosenberg, H.: Polar Excitation of Heart, 41
Rosenberg, M.: Residual N in Kidney Disease, 144
Rosenbloom, J.: Blood-Pressure in Diabetes, 443; Sugar Tolerance in Menstruation, 380
Rosemann, R.: Gastric Secretion, 504
Rosenow: Pituitary Extract, 521
Rosenow, G.: Guanidine on Heart, 499
Rosenthal, F., and Meier, K.: Blood in Jaundice, 595
Rosenthaler, L.: Cell Membranus and Fe, 355; HCN in Plants, 337
Roskam, J.: Bladder Tone, 62; Platelet Functions, 566; Platelets, 367; Platelets and Coagulation Time, 254; Platelets and Coagulation, 310
Rösler, O. A.: Blood Picture and Ca Injections, 255
Ross, E. L., and Davis, L. H.: Anæsthetic Hyperglycæmia, 51
Ross, E. L.: See Davis, L. H.
Ross, J. P.: Blood Coagulation and Reaction, 187
Rosser, C.: Endocrine Organs, 582
Rossi, A.: Atropin and Liver Structure, 389; Atropine Glycosuria, 515; Bile and Reflexes, 122
Rossi, G., and Spadolini, I.: Class Experiments, 402
Rost, C. O., and Alway, F. J.: Glacial Drift Soils, 345
Roth, G. B.: Intravenous Injection, 170
Rother, J.: Fæces and Yeast, 267
Rother, J., and Szegö. E.: Uric Acid and Thymus, 520
Rother, J.: See Szegö, E.
Rothfeld, J.: Vestibular Reactions, 620; Vestibule Reactions, 184
Rothlin, E.: Action of Spleen Extracts, 149; Blood-vessel Contractions, 44; Diastase, 551
Rothlin, E., and Gundlach, R.: Histamine on Stomach, 574
Rothstein, M.: See Michaelis, L.
Rouchelman, N.: See Fosse, R.
Roughton, F. J. W.: See Barcroft, J.
Rouse, M. E.: See Sherman, H. C.
Rous, P., and McMaster, P. D.: Concentration by Gall-Bladder, 56; Gall-Bladder, 374
Roussy, G.: See Camus, J.
Roux, W.: Functional Adaptation, 3
Rouzaud, and Thiéry: Blood Viscosity and Cholesterol, 627; Blood Viscosity and Uric Acid, 626
Rowntree, L. G.: Drug Therapy, 523
Rowntree, L. G.: See Larson, E. E.
Rubner: Tree Forms, 167
Rubner, M.: Ca Deficiency, 262; Ca Metabolism, 579
Rubnitz, A. S.: See Peters, A. W.
Rucker, M. P.: Hb Post Partum, 450
Rucker, M. P., and Haskell, C. C.: Pituitary Extract Dangers, 227
Rudolf, R. D.: Empiricism, 642
Rudolfs, W.: Water Absorption by Seeds, 342
Ruotsalainen, A.: Protein Metabolism in Child, 438
Rule, F. D.: See Peters, J. P.
Rumsey, C. F.: Ca Metabolism and Teeth, 66
Runnström, J.: Blood Sedimentation, 624
Runnström, J., and Schou, S. A.: Blood Sedimentation, 495
Runnström, J.: See Hammarsten, O. D.
Russ, C.: Vision Apparatus, 349
Russ, S.: Radiations, 609
Russ, V. K., and Oesterlin, E.: Phyto-Hæmagglutimus, 224
Ruston, A. C.: Plants and Smoke, 168
Rusznyák, S.: Blood Sugar, 188; Chloride Estimation, 171
Rusznyák, S., and Hetényi, G.: Serum Sugar, 516
Rütimeyer, W.: See Löffler, W.
Ruttner, F.: Plant Assimilation, 649
Ryan, A. H., and Florence, P. S.: Work and Output, 169
Ryder, G. H.: Pituitin in Labour, 447
Ryffel, J. H.: Gastric Test Meals, 137

Saar, R.: See Hastings, L.
Sabbatani, L.: Effects of Iron, 594; Ferrous Sulphate, 454; $KMnO_4$ on Blood, 494
Sabin, F. R.: Embryonic Blood, 554
Sabnis, T. S.: Desert Plants, 94, 336, 530, 644
Saccardi, P.: Melanuria, 513
Saccardi, P.: See Masucci, P.
Sachnovska, A. A.: See Zaleski, I. A.
Sachs, E., and Alvis, B. Y.: Eighth Nerve, 619
Sachs, H., and Oettingen, K. v.: Blood Plasma, 190
Sachs, P.: See Hermanns, L.
Sachs, P.: See Thannhauser, S. J.
Sachs, P., and Malone, J. Y.: Intracranial Pressure, 185
Saelhof, C. C.: See Petersen, W. F.
Safford, W. E.: Narcotic Plants, 338
Sailer, J.: Sex Determination, 18
Saitô, K.: See Kawase, S.
Sakagachi, K., and others: Blood Sugar, 515
Sakamura, T.: Cell Division, 222
Salant, W., and Battle: Chenopodium Oil, 388
Salant, W., and Kleitman, N.: Acetone Pharmacology, 330; Action of Hg, 453; Heavy Metals, 388; Toxicity of Skatole, 455
Salazar, A. L.: Rabbit Ovary, 586
Sale, B. E.: See Bartholomew, R. A.
Salén, E.: Hæmolysis, 34
Salge, B.: Development Rate, 486

Salisbury, E. J.: Calcicolous Habit, 103
Salkowski, E.: Cellulose, 531; Formaldehyde, 173; Melanin, 111; Oxalic Acid in Urine, 381; Saccharase, 339; Urinary Secretion, 517
Salomon, E.: See Rabe, F.
Salomonson, J. K. A.: Wertheim Tonus and Reflexes, 182
Salter, R. M., and McIlvaine, T. C.: Germination and P_H, 460
Salvesen, H.: See Palmer, W. W.
Samec, M.: Polysaccharides, 173
Samec, M., and Matula, J.: Plant Colloids, 337
Samec, M., and Meyer, A.: Amylopectin, 531; Plant Colloids, 337
Sammartino, U.: See Elias, H.
Samson, G.: Blood Chloride, 368
Sanctis-Monaldi, T. de: Saliva Secretion, 432
Sand, K.: Sex Glands, 522
Sandberg, M.: See Neuberg, C.
Sandiford, I.: See Boothby, W. M.
Sandiford, Irene: See Boothby, W. M. (Review), 104
Sandiford, K.: See Boothby, W. M.
Sandiford, R. B.: See Boothby, W. M.
Sands, C. E.: Tomato Ripening, 101
Sanger, B. J.: Glucose Mobilisation and Thyroid, 146
Sano, M.: Chylous Urine, 209
Sansom, G. S.: Parthenogenesis, 77
Santenoise, D., and Tinel, J.: Digestive Leucocytosis, 591
Santenoise, D.: See Garrelon, L.
Santenoise, D.: See Tinel, J.
Santesson, C. G.: Spinal Poisons, 454
Saphier, J.: Xylol Substitute, 7
Sarin, E.: Honey, 435
Sartory, A.: Perithecia of Aspergillus, 161
Sasaki, T.: Glycyl Reaction, 171
Sasaki, T., and Kinose, J.: Bacterial Action, 645
Sasaki, T., and Otsuka, I.: Tryptophane Bacteria, 645
Sassa, K.: Proprioceptive Reflex, 619; Reflex Response, 620
Sassa, K., and Sherrington, C. S.: Flexor Reflex, 24
Sata: Urine after Swimming, 518
Satava, J.: Spontaneous Fermentation, 226
Sauer, L. W.: See Mattill, P. M.
Sauter, M. D.: See Reimann, S. P.
Sauvageau, C.: Gelose from Algæ, 285
Savage, W. G.: Toxic Food, 390
Savini, E.: Leucocyte Lipoids, 300
Sawa, S.: Blood Pigments, 497
Sayers, R. R., and Herrington, D.: Conditions in Mines, 1
Sazerac, R., and Levaditi, C.: Bi Treatment, 454; Trypanosomes, 454
Sbarsky: See Bach, A.
Scala, A.: Salts and Colloids, 173
Scammon, R. E.: Thyroid and Thymus in Man, 146
Scarborough, E. M.: Drugs on Frog Muscle Work, 278
Schaber, H.: See Tannhauser, S. J.
Schaefer, J. G.: Colour Change of Fish, 236; Medusæ, 241
Schaefer, J. G.: Hypnosis, 623; Rigor and Contraction, 118
Schaefer, O. G.: See Dutcher, R. A.
Schaefer, R.: See Eisenhardt, W.
Schaeppi, H.: Permeability, 554
Schäffer, H.: Muscle Autonomics, 120; Muscle Tone, 21
Schaffer, P. H.: See Briggs, A. P.
Schaffnit, E.: Potato Wart, 544
Schamberg, J. F.: See Raiziss, G. W.
Schanz, F.: Fluorescence, 469; Lens Changes, 561; Light and Plants, 167
Scheer, K.: Serum Cl, 426
Schemensky, W.: Blood Sedimentation, 186; Stalagmones, 63
Schempp, E.: Fate of Cyclic Compounds, 635
Schempp, E.: See Thierfelder, H.
Schenck, M.: Bile Acids, 9
Schenk, P.: Blood Coagulation, 37; Organ Extract Glycosuria, 516; Saline Infusions and Blood Sugar, 514
Schenk, P.: Effect of Histamine, 332
Schenker, R.: Aspergillus Lipase, 534
Scheringa, K.: Cellulose Adsorption, 7
Schettler, O. H.: See Sollmann, T.
Scheunert, A., and Trautmann, A.: Saliva Secretion, 573
Scheuring, L.: Eyes of Fish, 306
Schiche, O.: Fish Reactions, 306
Schick, B.: Icterus Neonatorum, 215; Infant Nutrition, 62
Schiff, E., and Peiper, A.: Ca Metabolism, 82; Thyroid and Urine, 446
Schildwächter, W.: Cooled Nerve, 488
Schilf, E.: See Sheng, C. L.
Schilling, V.: Blood Platelets, 255; Kupfer Cells, 576
Schirmer, O.: Fat Tissue, 301
Schirokauer, H.: Kidney in Diabetes, 52
Schiøtz, C.: Height and Weight of Children, 141
Schlenner, F.: Oxidase Reaction of Monocytes, 117
Schlesinger, E.: Thyroid Hyperplasia, 272
Schlesinger, O.: Climacteric Blood-Pressure, 384
Schley, E. O.: Geo-Reactions, 101
Schlomovitz, B. H.: Digitalis on S-A Node, 628; Fibrillation, 257; Sino-Auricular Node, 257
Schlomovitz, B. H.: See Loevenhart, A. S.
Schlomowitz, B. H.: See Schlomowitz, H. H.
Schlomowitz, H. H., and others: Hæmorrhage and Oxygen Usage, 195
Schloss, O. M.: Intestinal Intoxication Toxins, 155
Schmidt, A. K. E.: Ringer for Vascular Reactions, 315
Schmidt, C. L. A.: Taurine Reaction, 297
Schmidt, C. L. A., and Dart, A. E.: Estimation of Bile Acids, 109
Schmidt, C. L. A., and Foster, G. L.: Glutamic Acid Preparation, 297
Schmidt, E. W.: Azotobacter, 229
Schmidt, H.: Fat Antibodies, 92
Schmidt, J. M.: Adonis Venalis, 81
Schmidt, L.: See Abderhalden, E.
Schmidt, P.: See Levy-Lenz
Schmidt, W. J.: Mussel Shell, 411
Schmidt-Nielsen, S.: Salted Meat and Fish, 507
Schmiedeberg, O.: Diabetes, 443; Mucin and Carbohydrate Group, 111
Schmiesing, T.: Digestion of Infant Foods, 137
Schmit-Jensen, H. O.: See Krogh, A.
Schmitz, A.: Muscle Development, 486
Schmitz, E.: Muscle Contraction, 358
Schmitz, E.: See Embden, G.
Schmitz, E.: Review, 106
Schnabel, A.: Methylene Blue and Bacteria, 645; Quinine in Blood, 591
Schneider, A.: See Dhéré, C.
Schneider, A.: See Franzen, H.
Schneider, E. C.: High Altitudes, 631
Schneider, E. C., and Truesdell, D.: Anoxæmia Effect, 195; Circulation in Anoxæmia, 370
Schneider, H. C.: See Aaron, A. H.
Schneller, M. A.: Sucrose Estimation, 338

Schnitzler: Mg Manures, 230
Schöbel, O.: See Monserrat, C.
Schoellhorn, K.: Nectar Yeasts, 225
Schöler, G.: See Wagner, H.
Schollenberger, C. J.: Lime of Soil, 346; Organic P of Soil, 344
Schönfeld, H.: Creatinine in Muscle Tone, 558
Schönleber, H.: Digitalis, 81
Schoonover, W. R.: See Whiting, A. L.
Schoppe, W. F.: See Pearl, R.
Schott, E.: Electrocardiogram and Poisons, 42
Schou, S. A.: See Runnström, J.
Schrapf, R.: See Barré, J. A.
Schroeder, H.: Plants and Seasons, 161
Schryver, S. B.: See Buston, H. W.
Schryver, S. B.: See Chibnall, A. C.
Schryver, S. B.: See Clayson, D. H. F.
Schryver, S. B.: See Manning, A. B.
Schübel, K.: Morphine and Metabolism, 82
Schübel, K.: See Pfaundler, M.
Schuckmann, W. v.: Amœba Serology, 113
Schudel, G.: Beet Anthocyanin, 336
Schuepp, O.: Growth of Plants, 160; Plant Tissue Tensions, 164
Schulenburg, W.: See Wieland, H.
Schüller, J.: Frog Rectum, 443
Schüller, J., and Athmer, F.: Veratrine Effect, 588
Schulmann, E., and Justin Besançon, L.: Tissue Reduction, 547
Schultz, E. S., and Folsom, D.: Crops, 461; Mosaic Disease, 464
Schultz, E. W., and Chandler, L. R.: Goat Milk, 216
Schultz, W.: Colour of Fur, 3
Schultze, O.: Cartilage Canals, 179
Schulz, H.: Quinine and Fermentation, 81
Schulz, J. A.: See Forbes, E. B.
Schulz, W.: Creatinine Excretion, 145
Schuster, E. H. J.: Ergometer Balance, 108
Schüt, L. W.: Vision in Birds, 252
Schütze, H.: Hæmagglutination, 34
Schwartz, A., and Meyer, P.: Automatism, 417
Schwartze, E. W.: Oil Intraperitoneally, 280
Schwarz, B.: See Jordan, H.
Schweriner, F.: Residual Nitrogen of Blood, 38
Scott, E. L., and others: Blood Sugar, 206
Scott, R. W.: Circulatory Stasis, 193; Digitalis, 387
Scott, V. T.: Physical Efficiency, 169
Scripture, E. W.: Vowel Sounds, 2
Sedgwick, J. P.: See McClendon, J. F.
Sedziak, F. A.: See Cameron, A. T.
Seeliger, R.: OsO_4 on Plants, 160
Seeliger, S., and Gorke, H.: Peptone Injection, 566
Segawa, M.: Infantile Scurvy, 203
Seidel, E.: Ciliary Fluid, 27; Vital Staining, 419
Seidell, A.: Silver Vitamin Compound, 202
Seiler, J.: Sex Chromosomes, 616
Seitz, A., and Becker, F.: Blood Pressure of Infants, 133
Seitz, L., and Wintz, H.: Radium Dosage, 80
Seki, M.: See Kosaka, K.
Sekine, H.: Arginine, 12
Sekita, N.: Carbohydrate Metabolism, 515
Sell, M. T.: See Steenbock, H.
Semerau, M.: Heart Arrhythmia, 43
Sen, P.: See Brahmachari, U. N.
Senner, W.: Breathing in Wind, 502
Seplúverda, H.: Adrenalin in Blood, 71
Sereni, E.: Baglioni Preparation, 620; Frog C. N. S. Preparation, 560
Servantie, L.: See Mauriac, P.
Shaffer, P. A.: Glucose and Acetone Bodies, 207; Ketosis, 443
Shaffer, P. A., and Hartmann, A. F.: Sugar Estimation, 6
Shaklee, A. O.: Eating and Drinking Arcs in Pigeon, 123
Shanks, W. F.: Choline and Creatine, 321
Shapovalov, M.: See Edson, H. A.
Sharpe, J. S.: See Findlay, L.
Sharpe, J. S.: See Nattrass, F. J.
Shaw, L. A.: See Drinker, C. K.
Shaw, L. A.: See Lund, C. C.
Sheard, C.: Eye Currents, 27
Shearer, C.: Bacterial Heat Formation, 340
Shearer, C., and Parsons, T. R.: Reaction of Cerebro-Spinal Fluid, 31
Sheasby, H.: Swelling of Pinna, 140
Shedd, O. M.: Calcium of Soil, 343; Soil Phosphate, 345
Shellshear, J. L.: Cerebral Arteries, 25
Sheng, C. L., and Schilf, E.: Crayfish Muscle Contraction, 246
Shepard, C. E.: See Greisheimer, E.
Sherman, H. C.: Amylases, 613; Vitamins, 633
Sherman, H. C., and others: Fat Soluble Vitamin, 140; Simple Foods, 263
Sherman, H. C., and Pappenheimer, A. M.: Rickets in Rats, 319; Rat Rickets, 436
Sherrill, J. W.: Diabetes, 637
Sherrington, C. S.: Supra-Maximal Contractions, 358
Sherrington, C. S.: See Sassa, K.
Sherwin, C. P., and Hynes, W. A.: Nitrobodies, 439
Sherwin, C. P., and Shiple, G. J.: Phenacetyl Amino-Acids, 205
Sherwin, C. P.: See Killian, J. A.
Shimizu, T.: Brain Composition, 360; Phrenosin in Body, 377; Polysaccharide Digestion, 374; Polysaccharide and Protein Metabolism, 377; Pyrol Elimination, 377
Shinosaki, Y.: Essential Oils, 286
Shiple, G. J.: See Sherwin, C. P.
Shipley, P. G., and others: Rickets, 319
Shipley, P. G.: See McCollum, E. V.
Shoji, R.: See Barcroft, J.
Short, J. J.: See Myers, V. C.
Shorten, J. A.: Dried Vegetables, 319
Shorten, J. A., and Ray, C. B.: Dried Vegetables, 320
Shrader, J. H., and Rabak, F.: Tomato Seed, 394
Shrive, J. W.: Soil Water, 540
Shrive, J. W.: See Jones, L. H.
Shull, A. F.: Hydatina Chromosomes, 410
Shull, C. A.: Moisture and Seeds, 97
Siebert, A.: Root Nutrition, 227
Sieburg, E.: Oxycoumarines, 218
Siefert and Helbig: Pine Chlorosis, 228
Sierp, H.: Light-Growth Reactions, 164; Rate of Growth, 227
Silva, A.: Pituitary, 72
Silvestrini, L.: Liver and Spleen, 55
Simmonds, N.: See McCollum, E. V.
Simmonds, N.: See Shipley, P. G.
Simms, H. S.: See Levene, P. A.
Simon, J.: Action of Glycerol, 131; Effect of Glycerol, 524
Simon, R., and Aron, M.: Bone Grafts, 617
Simon, S. V.: New Growth in Plants, 227
Simonnet, H.: See Penau, H.
Simpson, G. E.: See Myers, V. C.
Simpson, S.: Thyro-parathyroidectomy, 211
Sindler, J.: See Friedenwald, J.
Singh, T. M.: Soil and Gypsum, 291
Siperstein, D. M.: Testis in Starvation, 65

Siperstein, D. M., and Litman, M.: Effect of Quinine, 279
Sirks, M. J.: Bean Hybrid, 232
Sisson, W. R., and Denis, W.: Milk Chlorides, 523
Sisson, W. R.: See Denis, W.
Sjöberg, K.: Enzymes of Algæ, 224
Skelton, R.: Heart Output, 570
Skramlik, E. v.: Cold-Blooded Heart, 427; Taste Equations, 622
Skramlik, E. v., and Hünermann, T.: Perfused Liver, 55
Slawik, E.: Plain Muscle in Skin, 119
Slosse, A.: As Poisoning, 282; Formic Acid in Metabolism, 68; Methods, 237
Sluiter, E.: Inulinase of Intestine, 261
Small, J.: Botany, 604; Geotropism, 397; Heliotropism, 101
Smart, W. A. M., and Hocking, F. A.: Refractometer, 294
Smiley, E. M.: See Artschwager, E.: Review
Smillie, W. G.: See Darling, S. T.
Smith, A. H., and others: Blood Oxygen Estimation, 49
Smith, A. M., and Mendel, L. B.: Colloids and Capillaries, 44
Smith, C. A.: See Hawk, P. B.
Smith, C. R.: Gelatin Swelling, 473
Smith, D. T.: Melanin in Cultures, 554
Smith, E., and Medes, G.: Vitamin, 578
Smith, F.: Review, 465
Smith, F. M.: A-V Bundle, 569
Smith, G. H.: See Winternitz, M. C.
Smith, H. P.: See Whipple, G. H.
Smith, H. W.: See Voegtlin, C.
Smith, J. H.: Phenol on Spores, 399
Smith, J. L., and Rettie, T.: Aldehydes and Fat Staining, 355
Smith, L. W., and others: Blood Carbon Dioxide, 47
Smith, M.: Blood Chlorides, 109
Smith, M. I., and Voegtlin, C.: Permeability of Meninges for As, 365
Smith, P. E., and Cheney, G.: Pituitary on Tadpoles, 447
Smith, S. C.: Heart Block, 42; Heart in Diphtheria, 499
Smith, T. O.: See Butler, O. R.
Snapper, I.: Hippuric Acid Excretion, 377
Snapper, I., and Dalmeyer, J. J.: Hb in Intestine, 456
Snapper, I., and Vloten, v.: Serum Indican, 39
Snoo, K. de: Amino-Acids of Blood, 368; Blood Amino-Acids, 188
Snyder, A.: See Dunlop, K.
Snyder, R. S.: See Neidig, R. E.
Soar, M. C.: Sugar, 56
Soda, T.: C. A. Fluid Viscosity, 564
Sogen, J.: Blood Survival, 187
Söhngen, N. L.: See Verkade, P. E.
Soisalon-Soininen, J. L.: See Gullichsen, R.
Soler, F. L.: See Howard, J. W.
Söler, L.: Sphygmomanometer, 350
Solla, R. F.: Protein Crystalloid, 228
Sollmann, T.: As on Rats, 594; Intoxicated Rats, 155; Quinotoxin, 218; Tannin and Astringency, 152
Sollmann, T., and others: Alcoholism, 84; Chronic Intoxications, 281
Sollmann, T.: See Cole, H. N.
Somersalo, E.: Rumination in Infants, 136
Sommerfeld, H.: Chlorosis and Growth, 204
Somogyi, R.: Acids on Yeast, 534; Fibrin Swelling, 406
Somogyi, R.: See Traube, J.
Sonn, A.: Divarinol, 337
Soparkar, M. B.: Peptone, 612
Sordelli, A.: Antibodies in Blood, 130
Sordelli, A.: See Houssay, B. A.
Sordelli, A.: See Kraus, R.
Sordelli, A.: See Wernicke, H.
Soref, E.: Radioactivity and Plain Muscle, 180
Souffland, G.: See Galippe, V.
Soula, L. C.: See Abelous, J. E.
Souza, D. H. de, and Hewitt, J. A.: Idio-Ventricular Periodicity, 628
Souza, D. H. de: See Hewitt, J. A.
Spadolini, J.: See Rossi, G.
Spaeth, R. A., and Dunham, G. C.: Rifle Shooting Test, 365
Spanje, N. P. v.: Hæmolysis, 254
Spatz, H.: Degeneration of Cord, 135
Spence, J. C., and Brett, P. C.: Hepatic Insufficiency, 632
Spencer, H.: See Woodruff, L. L.
Spencer, O. M.: Air Dust, 1
Speyer, E. R.: Chemotropism in Flies, 615
Spiegel, E. A.: Nerve Refractivity, 619
Spiegel, E. A., and Sternschein, E.: Tonic Reflex, 618
Spiro, K.: β-Oxidation, 405
Spiro, K.: See Asher, L.
Spiro, K.: See Asher, L.: Review
Spitz, G.: Horse Laryngoscope, 294
Sprague, T. A.: Plant Dermatitis, 599
Spurrell, W. R.: See MacKeith, N. W.
Squier, T. L., and Newburgh, L. H.: High Protein Diet, 444
Squier, T. L.: See Grabfield, G. P.
Staden, A. v.: See Windaus, A.
Stadie, W. C.: Met-Hb in Pneumonia, 284
Staehelin, M.: See Faes, H.
Stålfelt, M. G.: CO_2 Assimilation, 602; Periodic Growth, 396
Stammers, A. D.: Vitamin Experiments, 508
Stanton, R. E.: See Mitchell, P. H.
Stanton, R. E.: See Sullivan, M. X.
Starling, E. H.: Heart Problems, 627; Law of Heart, 369
Starlinger, W.: Blood Agglutination, 254; Blood Sedimentation, 495; Plasma Flocculation, 626
Starlinger, W.: See Frisch, A.
Starr, I.: NaCl Toxicity and O_2 Tension, 115
Starr, M. A.: Tea Intoxication, 280
Staub, H.: Enzyme Formation, 322; Sugar Metabolism, 377, 441
Stauder, H.: Hearing of Butterfly, 300
Stearns, G., and Lewis, H. B.: Creatinuria, 267
Steenbock, H., and others: Fat Soluble Vitamin, 375 Vitamin, 435, 633; Vitamin A, 201
Steenbock, H.: See Ellis, N. R.
Steenbock H.: See Gross, E. G.
Steenbock, H.: See Hart, E. B.
Stehle, R. L.: Blood Nitrogen, 38; N and Urea Estimation, 381
Stehle, R. L., and McCarty, A. C.: Urine after Acids, 444
Steibelt, W.: See Willstätter, R.
Stein, E.: Ocular Pressure Measurement, 470
Steinberg, M. E.: Gastric Juice in Diabetes, 442
Steinruck, A.: See Heiduschka, A.
Steinhausen, W.: Electronic Tube Resistance, 108 Latent Period of Muscle, 119
Steinhausen, W.: See Kauffmann, F.
Stejskal, K.: See Latzel, R.
Stejskal, W.: Hypertonic Infusions, 453

Stephan, R.: Spleen and Blood Coagulation, 89
Stephan, R., and Wohl, E.: Serum Proteolysis, 551
Stephenson, M.: Plant-Pigments and Vitamins, 60
Stepp, W.: Dried Milk, 386; Blood Sugar, 404
Stepp, W., and Diebschlag, E.: Glycuronic Acid in Blood, 439
Stepp, W., and Engelhardt, W.: Acetone and Aldehyde Estimation, 8
Stepp, W., and Feulgen, R.: Aldehyde in Diabetic, 322
Stepp, W., and Fricke, R.: Aldehyde and Acetone, 610
Stepp, W., and Lange, H.: Aldehydes in Diabetes, 66
Stepp, W., and Zumbusch, H.: Formic Acid in Urine, 66
Stern, K.: Chlorophyll, 458
Stern, L.: Cerebro-Spinal Fluid, 564
Stern, L., and Gauthier R.: Cerebro-Spinal Fluid, 564
Stern, L.: See Battelli, F.
Stern, R.: See Frank, E.
Sternschein, E.: See Spiegel, E. A.
Steuber, M.: See Baumgardt, G.
Steuber, M.: See Klein, W.
Steudel, H.: Creatine Preparation, 8; Nucleic Acid of Spermatozoa, 275; Nucleic Acid of Spleen, 296
Steudel, H., and Chou, S. S.: Urinary Purines, 518
Steudel, H., and Peiser, E.: Nucleic Acids, 10; Yeast Nucleic Acid, 338
Stévenin, H.: See Labbé, M.
Stevenson, H. C.: See Eddy, W. H.
Stewart, F. C.: Potato Spacing, 461
Stewart, G.: Alfalfa, 542
Stewart, G. N.: Adrenal Insufficiency, 327; Blood in Lungs, 629; Circulation Time in Organs, 629; Heart Output, 498; Organ Weight and Surface, 635
Stewart, G. N., and Rogoff, J. M.: Adrenaline Output, 273
Stewart, G. R.: Continuous Cropping, 346
Stewart, J. P.: Muscle Tone, 22
Stheeman, A. H., and Arntzenius, A. K. W.: Ca Deficiency, 157
Stickel, M., and Zondek, B.: Menstrual Blood, 78
Stieglitz, E. J.: Renal Secretion, 207, 580
Stift, A.: See Fulmek, L.
Stiles, W.: Electrolytes and Gels, 645
Stiles, W., and Adair, G. S.: Penetration of Gels, 645
Stillman, E.: See Austin, J. H.
Stillmunkés, A.: See Bardier, E.
Stillmunkés, A.: See Rabaut, C.
St. John, E. Q.: See Hepburn, J. S.
Stockis, E.: Reaction for COHb, 255
Stockstad, P. C.: Catalase in Fish, 112
Stoeltzner, W.: Rickets, 219, 576
Stoland, O. O., and Korb, J. H.: Pituitrin Diuresis, 213
Stoland, O. O., and Walling, L.: Catalase, 175
Stopford, J. S. B.: Tactile Localisation, 492
Stoppel, R.: Electricity and Plants, 233
Straczewski, A.: See Thomas, K.
Stransky, E.: Karlsbad Waters, 512
Strassmann, G.: Hæmin Crystals, 13
Stratton, G. M., and others: Psychological Tests, 185
Straub, H., and Meier, K.: Effect of B, Al, La, and Digitalis on Hb, 46
Straubel, M.: Heart Arrhythmia, 42
Strauss, E., and Grutzner, R.: Iodoglobulin, 10
Strauss, E.: See Blum, F.
Strauss, H.: Urea as Diuretic, 388
Strauss, H., and Rammelt, G.: Blood Catalase, 178
Streel, du Vivier de: See Fauré-Frémiet, E.
Streeter, G. L.: Embryo Dimensions, 586
Streeter, L.: Ear Vesicle, 250
Strohl, A.: Nerve and Muscle Excitability, 609
Strohmann, H., and Flintzer, S.: Urea Estimation, 549
Strong, L. C., and Little, C. C.: Transplanted Tumours, 157
Strongman, B. T., and Bowditch, H. I.: Rickets, 264
Strouse, S.: Blood Sugar Variations, 49
Strowd, W. H.: N in Bean Nodules, 341; Plant Nitrates, 338; Plant Nodules, 340
Stuart, E. H.: See Rhodehamel, H. W.
Stübel, H.: Adrenaline on Liver Protein, 147
Sturges, M. M., and Levin, I.: Radium and X-Rays, 495
Sturgis, C. C.: See Peabody, F. W.
Such, M. P. y: See Lafora, G. R.
Such, M. Prados y: See Prados, M.
Suda, K.: See Kawase, S.
Sudzuki, M.: See Morimoto, Y.
Suga, T.: Ornithuric Acid, 205
Sullivan, M. X.: Pellagra Urines, 445
Sullivan, M. X., and Dawson, P. R.: Pellagra, 197, 445
Sullivan, M. X., and others: Urine Pellagra, 268
Sumner, J. B.: Sugar Estimation, 170; Sugar Reagent, 379
Sundstroem, E. S., and Bloor, W. R.: Low Pressures, 38
Suñer, A. P., and Bellido, J. M.: Vagus Terminals, 359
Supplee, G. C., and Bellis, B.: Citric Acid of Milk, 642
Supplee, G. C.: See Hess, A. F.
Sure, B.: Proline of Peas, 199, 321
Sutherland, G. F.: Gastric Secretion, 197, 261
Svanberg, O.: Saccharase, 13, 408
Svanberg, O.: See Euler, H. v.
Svensson, J.: See Bjure, A.
Swanson, C. O.: HCN in Grass, 200, 599; Pig Rations, 633
Swanson, W. W.: See Kingsbury, F. B.
Sweeney, J. R.: See Hewlett, A. W.
Sweet, J. E.: See Miller, W.
Sweet, J. E.: See Tatum, A. L.
Swingle, W. W.: Pituitary and Tadpoles, 447
Swindle, P. F.: Colour Vision, 620
Szegö, E., and Rother, J.: Gastric Secretion, 505
Szegö, E.: See Rother, J.
Szenes, A.: Blood Coagulation, 129; Spleen and Blood Clotting, 188
Szent-Györgyi, A. v.: Agglutination, 173; Cataphoresis, 7, 219; Electrolytes on Albumin, 12
Szent-Györgyi, A. v.: See Leeuwen, W. S. v.
Szlapka, T. L.: See Griffin, H. Z.
Szolnoki, J.: Water Transport, 164
Szymanski, J. S.: Animal Behaviour, 31
Szyszka, W.: See Nonnenbruch.

Tacke, B.: Roots and Humic Acid, 103
Takahashi, N.: See Hess, W. R.
Takahashi, E.: Muscle Proteins, 558
Takahata, T.: Creatine and Creatinine, 142
Takata, M.: Colorimetric Methods, 172; Gastric Juice, 574; Pepsin Estimation, 551
Takata, M.: See Morimoto, Y.
Takei, T.: Red Cell Volume, 624; Water of Blood, 186
Takeno, Y.: Milk Analysis, 477

Takenuchi, S.: Muscle Glycogen, 555
Talbert, G. A.: Reaction of Sweat, 210
Talbot, F. B.: See Benedict, F. G.
Tamura, K.: Fate of Morphine, 153, 525
Tamura, K., and Miwa, M.: Gas Exchange of Kidney, 144; Kidney Secretion, 517
Tanner, W. F., and Echols, G. L.: Pellagra, 265
Tapernoux, A.: See Porcher, C.
Taschenberg, E. W.: Mikulicz Syndrome, 213
Tashiro, K.: Exodic Inhibition and Excitation, 217
Tashiro, S.: NH_3 of Nerve, 181
Tashiro, S., and Hendricks, E. M.: CO_2 Production, 182
Tatum, A. L.: Adrenaline Hyperglycæmia, 379; 520, 584
Tatum, A. L., and Sweet, J. E.: Thyroid, 146
Tausz, J.: Hydrocarbon Analysis by Bacteria, 163
Tawara, S.: Adrenaline and Tetanus, 457
Tayler, W.: Apple Injury, 649
Taylor, M. C.: See Dehn, W. M.
Taylor, N. B.: Temperature Spread, 205
Taylor, N. B.: See Macleod, J. J. R.
Taylor, R. H.: See Overholser, E. L.
Taylor, W. H.: Seed Potatoes, 461
Tchahotine, S.: Cytological Method, 18; Radiopuncture, 355
Teacher, J. H.: See Pringle, J. H.
Tedeschi, V.: Excitability of Brain, 183; Resistance of Nerve, 247
Telfer, S. V.: Cod-Liver Oil and Ca Exchange, 154; Ca and P Excretion, 432
Tennent, D. H.: Nuclear Activity, 19
Terashi, Y.: Bilateral Movements, 559
Terni, T.: Spinal Ganglion Hypertrophy, 619
Terroine, E. F.: See Fredericq, H.
Terroine, E. F., and Barthélémy, H.: Frog Eggs, 586, 587
Tervaert, D. G. C.: Blood Sugar, 404
Terwen, A. J. L.: Urea Estimation, 5
Teschendorf, W.: Artificial Diastases, 113; Cations on Vessels, 386; Chloroform Necrosis, 526; Leech Preparation, 610
Tezner, O., and Turolt, M.: Stomach Movements, 504
Thalhimer, W.: Blood Sugar and Boils, 49
Thannhauser, S. J.: Serum Bilirubin, 610
Thannhauser, S. J., and Czoniczer, G.: Purine Metabolism, 334
Thannhauser, S. J., and Ottenstein, B.: Nuclein Metabolism, 513
Thannhauser, S. J., and Sachs, P.: Nuclein Derivatives, 11
Thannhauser, S. J., and Schaber, H.; Nuclein Metabolism, 377
Thaysen, A. C.: See Fleming, N.
Theis, R. C., and Benedict, S. R.: Blood Urates, 496
Thévenon, L.: See Morel, A.
Thévenot, L.: See Arloing, F.
Thiébaut, R.: Vitamins and Enzymes, 59
Thierfelder, H.: Glutamine Constitution, 239
Thiery: See Rouzaud
Thiery, J.: See Grigaut, A.
Thierfelder, H., and Schempp, E.: Phenylhydroxybutyric Acid, 513
Thivolle, L.: See Fontès, G.
Thjotta, T., and Avery, O. T.: Bacterial Vitamins, 341
Tholin, T.: Co-Enzyme Thermostability, 536
Thoma, R.: Flow in Arteries, 429
Thomann, W.: Crude Fibre Digestion, 200
Thomas, C. P.: Auricular Fibrillation, 257
Thomas, E. M.: See MacLean, I. S.
Thomas, H. E.: Celery Infections, 104
Thomas, J. E.: Acid Fuchsin Convulsions, 390
Thomas, J. E.: See Wheelon, H.
Thomas, K., and Straczewski, H.: Nitrogen Minimum, 138
Thomas, L. J.: Otocysts, 420
Thomas, M. D.: Soil Vapour Pressures, 606
Thomas, P.: Protein Tryptophane, 174; Tyrosine Estimation, 351; Yeast Proteins, 532
Thooris, A.: Diving Experiments, 349
Thorne, C. E.: Nitrate Fertilisers, 291
Thro, W. C., and Ehn, M.: Blood Calcium, 311
Thrun, W. E., and Trowbridge, P. F.: Histidine Estimation, 111
Thuillant, R.: See Garrelon, L.
Tichy, H.: Liver and Blood Clotting, 310
Tiedje, H.: See Loewy, A.
Tigerstedt, C.: Inanition, 263
Tihen, H. N.: Basal Metabolism, 65
Tillmans, J., and Bohrmann, A.: Food Ash, 262
Tinel, J., and Santenoise, D.: Leucocyte Changes, 565
Tinel, J.: See Santenoise, D.
Ting, G. C.: See Macht, D. I.
Tinkler, C. K.: Fumed Oak, 458
Tisdall, F. F., and others: Serum Ions in Tetany, 456
Tisdall, F. F., and Kramer, B.: Blood Na, K, Ca, Mg, 548
Tisdall, F. F.: See Kramer, B.
Titchener, E. B.: See Boring, E. G.
Tocher, J. F.: Milk Yield, 642
Todd, T. W., and Gorder, L. V.: Negro Skin, 414
Toida, R.: Gall-Bladder Bile, 138; Hydrops of Gall-Bladder, 138; Small Intestine Removal, 138
Tokuda, K.: See Hammett, F. S.
Tokumitsu, Y.: Suprarenals and Pancreas, 71 Suprarenal Cortex, 639
Tolstoi, E.: See Barbour, H. G.
Tomita, M.: Autolysis of Egg, 474; Egg Chemistry, 474; Galactose Fermentation, 534, 646; Malic Acid Fate, 635; Methylation in Body, 513; Silk-Worm Egg Shell, 474
Tompkins, E. M.: See Peabody, F. W.
Tongu, Y.: Thymus Extirpation, 520
Toni, G. de: See Labbé, H.
Tonnet, J.: See Loeper, M.
Torraca, L.: Blood Supply of Nerves, 121; Narcotics and Phagocytes, 480
Tottingham, W. E., and Hart, E. B.: S and Soils, 345
Tournade, A., and Chabrol, M.: Splanchnic and Adrenaline, 520
Tournay, A.: Sympathetic and Sensation, 618
Tozer, F. M.: Fat-Poor Diets, 264; Avitaminosis, 375
Traube, J.: H-ion, 407; Viscostalagmometer, 403
Traube, J., and Klein, P.: Narcosis, 452
Traube, J., and Somogyi, R.: Disinfection, 453
Traugott, K.: Ultra-Violet on Blood Cells, 35, 37
Trautmann, A.: Thyroid and Parathyroid, 211
Trautmann, A.: See Scheunert, A.
Trelease, S. F.: KCl and Plant Growth, 395
Trelles, R. A.: See Reichert, F.
Trendelenburg, P., and Goebel, W.: Tetany and Ca, 326
Trendelenburg, W.: Gas Analysis, 5
Trendelenburg, W.: See Bass, E.
Trevan, J. W., and Boock, E.: Anæsthetics and Respiratory Centre, 136
Troell, A.: See Hesser, C.
Troensegaard, N.: Protein Pyrrol Structure, 10

Troland, L. T.: Visual Response, 306
Trowbridge, P. F.: See Thrun, W. E.
Truesdell, D.: See Schneider, E. C.
Truog, E.: See Parker, F. W.
Tschermak, A.: Subjective Sense Physiology, 251; Visual Apparatus, 236
Tschirch, A.: Sense of Smell, 492
Tschirdewahn, F.: Corpus Luteum and Menstruation, 78
Tsuji, R.: Diet and Thyroid, 147
Tsujimoto, M.: Fish Oils, 9
Tsujimoto, M., and Kobayaschi, S.: Reptile Oils, 474
Tullio, P.: Semicircular Canals, 125
Tully, A. M. T.: Working-Class Nutrition, 318
Tully, A. M. T.: See Gribbon, M. R.
Tupa, A.: See Bourguignon, G.
Turolt, M.: See Robitschek, W.
Turolt, M.: See Tezner, O.
Turrell, G. H.: See Wald, L. T. Le
Turrô, R.: Sense of Touch, 126
Tutin, F.: Pectin, 459
Tzanck, A.: Arsenobenzol Shock, 594
Tzanck, A.: See Flandin, C.

Uexküll, J. von: Flight of Birds, 121
Uhlenhuth, E.: Gigantism, 72
Uhlmann, F., and Abelin J.: Opium on Intestine, 82
Uhlmann, F., and Mirmelstein, V.: Secalopan, 218
Ukai, S.: Esterase of Nerves, 182
Ullmann, H.: See Dressel, P.
Ulrich, J. L.: Integration of Movements, 252
Umbreit, F.: See Gibson, C. A.
Underhill, F. P., and Nellans, C. T.: Thyroid and Sugar, 638
Underhill, F. P., and others: Effect of Protein Derivatives, 635
Underhill, F. P.: See Ringer, M.
Underhill, S. W. F.: See Bainbridge, F. A.
Underhill, S. W. F.: Lung Circulation, 570
Unger, L. J.: Blood Transfusion, 34
Unger, L. J.: See Hess, A. F.
Unna, P. G., and Wissig, E. T.: Gastric Mucosa, 504
Uphof, J. C. T.: Cacti and Cold, 397
Uridil, J. E.: See Cannon, W. B.
Ursprung, A., and Blum, G.: Leaf Absorption, 164
Ursum, W.: See Neuberg, C.
Uyeda, K.: Anæsthetics on Nerves, 360
Uzhofer, I.: CO_2 and Depth of Respiration, 47

Vahl, M.: Ecology in Norway, 650
Valentine, A. T.: See Harris, J. A.
Vallery-Radot, P.: See Widal, F.
Van Boeckel; See Myttenaere, F. de
Vandel, A.: Regeneration in Planaria, 242
Vandevelde, A. J. J.: Fat Solubilities, 173
Vandorfy, J.: See Jarno, L.
Van Dyke, H. B.: Iodine and Thyroid, 271; Thyroid Iodine, 69; Thyroid-Iodine Distribution, 382
Van Laer, H.: See Chabot, C.
Van Laer, M. M.: Malt Lipase, 226
Van Saceghem, R.: Petrol as a Drug, 330
Van Slyke, D. D.: Acid-Base Balance of Blood, 598; Carbon Dioxide of Blood, 47
Van Slyke, D. D., and Binger, C. A. L.: Lung Volume, 259
Van Slyke, D. D.: See Austin, J. H.
Van Urk, H. W.: Shepherd's Purse, 337
Vargolici, V.: See Jonescu, A.
Varrier-Jones, P. C.: See Woodhead, G. S.
Veil, W. H.: Blood Cl in Polyuria, 63
Velter, E.: Retinal Artery Pressure, 124
Velter, E.: See Duverger, C.
Venkataraman, K.: See Fyson, P. F.
Verdozzi, C., and Cavalieri, R.: Ovary Hormones, 385
Vergelot, C.: Plant Sugars, 647
Verkade, P. E., and Söhngen, N. L.: Moulds and Cis-Trans-Forms, 162
Verlaine, L.: Heredity, 235
Vermeulen, H. A.: Hypophysis Tumours, 274
Verne, J.: Carotene and Cholesterine, 15
Vernet, and Mones, G.: Inferior Mesenteric Ganglion, 489
Vernon, H. M.: Fatigue, 1
Vernoni, G.: Bloodvessels, 501
Verzár, F.: See Leeuwen, W. S. v.
Viale, G.: Electrophysiology, 617; Frog Plain Muscle, 487; Photodynamic Phenomena, 117
Viale, G., and Gianturco, G.: Effects of Alcohol, 524
Vila, A.: See Piettre, M.
Villedieu, G.: Cu Toxicity, 288
Vincent, S.: Medical Research, 107
Vincent, S., and Hollenburg, M. S.: Endocrines in Starvation, 212
Vines, H. W. C.: Blood Clotting, 424; Blood Coagulation and Ca, 309
Vinnis, E. W. G.: Cardiac Inhibition, 40
Violle, P. L.: Hippuric Acid Elimination, 145; Hippuric Synthesis, 324
Vladesco, R.: See Bertrand, G.
Vlès, F.: Cell Division and Osmotic Pressure, 241; Hæmoglobin Cyanogen Derivatives, 12
Vlès, F.: See Dragoiu, J.
Vlès, F.: See Mayer, A.
Vloten, V.: See Snapper, I.
Voegtlin, C., and Smith, H. W.: Arsphenamine, 526; As Compounds and Trypanosomes, 152
Voegtlin, C.: See Smith, M. I.
Voelkel, H.: Rest Current and Excitability, 557
Vogel, R.: See Bornstein, A.
Vogt, C. u. O.: Corpus Striatum and Pallidum, 25
Voigt, E.: See Noyes, H. A.
Voigt, J., and Fritz, M.: Colloidal Metals, 444
Volta, A. D.: Thiry Fistulæ, 433
Völtz, W., and others: Fungus as Food, 263
Vorbuchner, K.: See Greisenegger, J. K.
Voron, J.: See Porcher, C.
Voronoff, S.: Thyroid and Testis Transplants, 382
Voronoff, S.: See Retterer, E.
Vorschütz, J.: Bacterial Agglutination, 129; Cell Permeability, 524; Permeability, 401
Vries, J. J. O. de: See Tocker, J. F.

Waardenburg, P. J.: Iris Pigmentation, 124
Wachholder, K.: Frog Reflexes, 305; Rhythmic Vessel Contractions, 501
Wachtel, C.: Alkaloid Tests, 452; Poison Gases, 84
Wacker, L.: Muscle Contraction, 416
Wacker, L., and Beck, K. F.: Cholesterol Metabolism, 378; Milk Cholesterol, 216
Waele, H. de: Blood in Anaphylaxis, 392; Lungs in Anaphylaxis, 335
Wagner, A.: See Franzen, H.
Wagner, C.: See Lipschütz, A.
Wagner H., and Schöler, G.: Straw as Food, 57
Wagner, K.: See Lipschütz, A.
Wagner, R.: Icterus Neonatorum, 215; Nutritional Indices, 204
Wahl, S. A.: See Karsner, H. T.
Waksman, S. A.: Soil Fungi, 543
Wald, L. T. Le, and Turrell, G. H.: Aviator's Heart, 132
Walden, G. B.: See Clowes, G. H. A.
Waldorp, C. P.: See Arrillaga, F. C.

Walker, E. R.: See Andersen, E. N.
Walker, H.: See Cooper, E. A.
Wallace, G. B., and Pellini, E. J.: Capillaries and Acidosis, 155
Wallace, H. A.: Corn and Weather, 342
Waller, A. D.: Emotion, 185; Marching, 64; Plant Contraction, 461; Plant Growth, 94, 227
Waller, A. D., and Decker, G. de: Energy of Miners, 266; Physiological Costs, 204; Swimming, 636; Work, 511
Walling, L.: See Stoland, O. O.
Wallis, R. L. M., and Hewer, C. L.: Anæsthetic, 451; New Anæsthetic, 329
Wallrich, L. A., and Dawson, P. M.: Ergo-meter Experiments, 401
Wallrich, L. A.: See Dawson, P. M.
Walshe, F. M. R.: Anoxæmia and C.N.S., 372; Babinski Reflex, 24; Elementary Nervous System, 182; Symptom Production, 609; Vitamins, 634
Waltan, O.: Hearing in New-Born, 621
Walter, H.: Plant Tissue Digestion, 644.
Walterhöfer, G.: Adrenalin Leucocytosis, 327
Walters, A. L.: See Clowes, G. H. A.
Walters, W.: Bence-Jones Proteinuria, 158
Wang, C. C., and Deutler, M. L.: Blood Creatine, 78
Warburg, O.: Cell Respiration, 412; HNO_3 Reduction by Plants, 159
Warburg, O., and Negelein, E.: Cystine Oxidation, 175
Ward, E. H. P.: Motility, 22
Ward, H. K.: See Dreyer, G.
Warden, C. C.: Alcoholic Fermentation, 600
Wardlaw, H. S. H.: See Tocker, J. F.
Warén, H.: Lichen Algæ Culture, 162
Waringer, P.: Fat Metabolism, 550
Warner, E. C.: See Mackeith, N. W.
Warnick, E. J.: See Blankenhorn, M. A.
Warren Smith, J.: Crops and Weather, 343
Wasfink, W. F.: Renal Pelvic Movements, 270
Wasicky, R.: Glucosides, 394
Wason, I. M.: Ophthalmia, 201
Wastl, H.: Adrenaline on Toad Skin, 638
Waterman, H. C., and Johns, C. O.: Protein and Cooking, 199
Waterman, H. C., and Jones, D. B.: Bean Protein, 434
Watanabe, C. K.: Blood in Renal Disease, 517
Waterman, N.: Ions in Cancer, 528; Metal Salt Hæmolysis, 495
Waterman, N., and Dirken, M.: Oxygen Usage in Cancer, 528
Watrin, J.: Choroid Plexus, 421
Watrin, M.: Cholesterol in Pregnancy, 385; Pregnancy Reaction, 393
Watson, A. F.: See Drummond, J. C.
Watson, A.: See Paton, D. N.
Wearn, J. T.: See Peabody, F. W.
Weatherwax, P.: Osmosis and Diffusion, 94
Weber, A.: Eggs in Peritoneal Cavity, 385; Toxicity of Peritoneal Cavity to Eggs, 328
Weber, H. H.: Lactic Acid and Rigor, 180; Rigor Mortis, 558
Weber, J.: See Grünhut, L.
Webster, L. T.: See Lewis, W. H.
Webster, T. A.: See Campbell, J. A.
Webster, T. A.: See Moore, B.
Wechselmann, A. C.: Lactacidogen, 484
Wedd, A. M.: Tachycardia, 429
Wedd, A. M.: See Drury, A. N.
Weed, L. H., and Hughson, W.: Cerebro-Spinal Pressure, 623
Wegeforth, H. M., and Wegeforth, P.: Ipecac for Turkeys, 280
Wegeforth, P.: See Wegeforth, H. M.
Wegelin, C.: New Cell Formation, 355
Wegelin, C., and Abelin, J.: Thyroid and Tadpoles, 326
Weghorst, J. H.: See Noyes, H. A.
Wegrzynomski, L.: Oxalic Acid Excretion, 67
Weichardt, W.: Tissue Extracts and Bacteria, 93
Weigert, F.: Retina, 492
Weil, A.: Gonad Extracts, 149
Weinberg, A. A.: Creatinine Excretion, 324
Weinberg, M.: See Lehnerdt, F.
Weinhagen, A. B.: Pseudo-Muscarine, 86
Weir, J. F.: See Larson, E. E.
Weir, J. F.: See McClure, C. W.
Weiser, S.: Lactation, 523
Weiss, E.: Urea Test for Kidneys, 63
Weiss, M.: Phenol in Urine, 5; Uric Acid Detention, 5
Weiss, R.: Ca in Blood, 568
Weiss, S.: Respiratory Quotient, 503
Weiss, S., and Hatcher, R. A.: Digitalis Therapy, 154
Weiss, S.: See Elias, H.
Weiss, St.: See Ernst, Z.
Weitz, W., and Hartmann, C.: Pulse Velocity, 629
Weitzel, W.: Salt Assimilation, 244
Welker, W. H., and Bollman, J. L.: Blood Catalase, 592; Cyanide and Catalase, 218
Wellmann, O.: Growth of Pigs, 376
Wells, E. B.: See Forbes, E. B.
Wells, E. L.: Lightning Fires, 343
Wells, F. L., and Kelley, C. M.: Psychological Apparatus, 31
Wells, F. L., and others: Fatigue, 563
Wells, F. L.: See Burtt, H. E.
Wells, F. M.: Teeth and Food, 319
Wells, H. G.: Anaphylaxis, 93
Welter, G.: See Nicloux, M.
Welti, H.: See Lian, C.
Wernicke, H., and Sordelli, A.: Oligodynamic Action, 407
Wertheimer: See Latarjet
Wertheim Salomonson: See Salomonson
Wertheimer, E.: Intestine Movements, 575
Wertheimer, E., and Dubois, C.: Seminal Vesicles, 449; Urine Secretion and Osmosis, 323
Wertheimer, E., and Duvillier, E.: Splanchnic and Suprarenal, 632
Wertheimer, E.: See Abderhalden, E.
Weskamp, C.: Pupil Movements, 306
Wesselow, O. L. V. de: See Maclean, H.
West, C.: See Briggs, G. E.
Westcott, W.: See Martindale, W. H.
Wester, D. H.: Chemistry of Orchids, 337; Mn of Plant Tissues, 531, 532; Urease of Soya Bean, 646
Wester, H.: Urease, 226
Westergren, A.: Blood Sedimentation, 334
Westermeier, K.: Leaf Pigments, 644
Westlake, H. J. W. J.: See MacKeith, N. W.
Wetmore, A. S.: Blood Chloride, 39
Wetmore, A. S.: See McClure, C. W.
Wettstein, F. v.: Alga Culture, 601; Moss Stomata, 644
Wetzel, N. C.: See Sollmann, T.
Wheat, S. D.: See Rogers, F. T.
Wheelon, H.: Stomach Contents, 632; Testes in Vasectomy, 275
Wheelon, H., and Thomas, J. E.: Pyloric Sphincter, 53

Wheelon, H.: See Neilson, C. H.
Wheeting, L. C.: See McCool, M. M.
Wherry, E. T.: Soil for Ericaceæ, 103; Soil Reaction for Ferns, 167
Whipple, G. H., and Robscheit, F. S.: Blood Regeneration, 425
Whipple, G. H., and others: Blood Volume, 366
Whipple, G. H.: See Davis, N. C.
Whitaker, L. R., and Forbes, A.: Reflex Inhibition, 181
White, C. P.: Copper in Tissues, 481
White, P. B.: Bee Bacteria, 15; Bigeminal Pulse, 427
White, P. D.: See Myers, M. M.
Whitehorn, J. C.: Chloride of Blood, 109
Whitehouse, W. E.: Apple Storage, 463
Whiting, A. L., and Hansen, R.: Bean Nodule Bacteria, 340
Whiting, A. L., and Schoonover, W. R.: N Fixation, 341
Whitley, E.: See Moore, B.
Whitlock, W. C.: See Kepner, W. A.
Whitten, J. C.: Transplanting, 93
Widal, F., and Vallery-Radot, P.: Antipyrine Anaphylaxis, 156
Widal, F., and others: Cold Shock, 455; Liver after Anæsthesia, 317
Widmark, E. M. P.: Succinodehydrogenase, 478; Thyroxin, 271
Widmark, E. M. P., and Lindahl, G.: Water of Tissues, 486
Widmer, F.: See Karrer, P.
Widtsoe, J. A.: See Gardner, W.
Wiechmann, E.: Blood Cell Permeability, 565; Ions and Red Cells, 366
Wieckhorst, H.: See Borsche, W.
Wieland, H.: Adsorptive Detoxication, 313; Gas Poisoning, 281
Wieland, H., and Kulenkampff, A.: Bile Acids, 9
Wieland, H., and Schulenburg, W.: Desoxycholic Acid, 240
Wieland, H.: See Eckstein, A.
Wiemann, B.: See Grimmer, W.
Wiener, S.: Phosphorus Estimation, 171
Wiesner, J.: Review, 106
Wiessmann, H.: See Lemmermann, O.
Wiggans, C. C.: Apple Crop, 102
Wiggers, C. J.: Cardiac Cycle, 192, 426; Cardiodynamic Studies, 256; Heart Sounds, 498; Pulmonary Circulation, 260; Venous Inflow and Arterial Pressure, 256
Wilbrand, E.: Blood and Sweating, 368; Onions and Digestion, 137
Wilbur, B. C.: See Martin, E. G.
Wilbur, J. W.: See Anderson, E. V.
Wildeman, E. de: Conjugaceæ, 229; Plant Automatisms, 601
Wilder, R. M., and Beeler, C.: Chlorides and Œdema, 207
Wilkins, R. H.: See Buckner, G. D.
Wilkins, S. D.: See Dutcher, R. A.
Will, H.: Yeast Settling, 225
Williams, H. B.: Heart Murmurs, 294
Williams, J. L.: Blood N in Nephritis, 568; Blood-Pressure and N, 368; Uric Acid in Pregnancy, 282
Williams, J. L.: See Miller, J. L.
Williams, J. W.: See Marshall, E. K.
Williams, M.: See Gardner, J. A.
Williams, R. J.: Vitamins and Yeast, 202; Yeast Growth Vitamins, 289
Williams, R. S.: Milk, 642
Williams, R. S.: See Mattick, E. C. v.
Willier, B. H.: Free-Martin Gonads, 213
Willigen, A. M. M. v. d.: Action of Purgatives, 152
Willis, A. M.: Alkali Reserve in Infection, 93
Willstätter, R., and Kuhn, R.: Adsorption of Saccharase, 478; Saccharase and Raffinase, 352
Willstätter, R., and Steibelt, W.: Maltose, 353, 395
Wilmanns, R.: Blood Urea, 597
Wilson, B. D.: Nitrogen in Rain Water, 343
Wilson, C. M.: See Pannett, C. A.
Wilson, D. C.: Auricular Flutter, 569
Wilson, D. W.: Pyrimidine Metabolism, 67
Wilson, F. N.: See Feil, H. S.
Wilson, J. T.: Muscle Innervation, 415
Wilson, J. W.: See Mitchell, P. H.
Wilson, S. A. K.: Argyll Robertson Pupil, 490
Wilson, W. H.: Pellagra and Diet, 391
Wiltshire, M. O. P.: Menstruation, 438
Windaus, A.: Cholesterol, 351, 612
Windaus, A., and Lüders, H.: Cholesterol Derivatives, 475
Windisch, W., and others: Higher Alcohols and Yeast, 225
Winge, Ø.: Variegation, 166
Winiwarter, H. de: Ova Development, 328
Winkin, C. S.: Anæmia of Medulla, 273
Winter, A. R.: See Forbes, E. B.
Winternitz, M. C., and others: Infection of Lungs, 93
Winterstein, H.: Respiratory Centre, 196; Rigor Mortis, 558
Wintrebert, P.: Cilia Reflex in Frog Embryo, 248
Wintz, H.: Corpus Luteum Action, 149
Wintz, H.: See Seitz, L.
Wirthle, F., and Amberger, K.: Cu in Yeast, 599
Wishart, M. B.: See Allen, F. M.
Wislicenus, H.: Wood Colloids, 95
Wislocki, G. B.: Colloids and Crystalloids in Fœtus, 277; Embryo Vital Staining, 586; India Ink Injection and Placenta, 215; Phagocytes in Marrow, 244
Wislocki, G. B., and O'Conor, V. J.: Ureter Ligation, 209
Wislocki, G. B., and Putman, T. J.: Hydrocephalus, 420
Wissig, E. T.: See Unna, P. G.
Witzemann, E. J.: Fat from Carbohydrates, 267; Glucose Oxidation, 8
Wöber, A.: Fungicidal Metals, 465; Plant Poisons, 233
Wodon, R.: See Hannaelt, L.
Woerdeman, M. W.: K in Electric Organ, 555
Woglom, W. H.: See Murray, J. A.
Wohl, E.: See Stephan, R.
Wöhlisch, E.: Blood Clotting, 424; Blood Clotting and Spleen, 188; Hæmophilia, 567
Wolf, C. G. L.: Bacterial Culture, 648; Spermatozoa 448
Wolf, E. P.: Inflammation, 482
Wolk, P. C., van der: Plant Excretion, 222
Wolkoff, M. I.: Soil and Salts, 291
Woodcock, H. M.: Hæmatophagy, 616
Woodger, J. H.: See Gatenby, J. B.
Woodhead, G. S., and Varrier-Jones, P. C.: Temperature Records, 142
Woodman, H. E.: Protein Racemisation, 296
Woodruff, L. L.: Infusoria, 551
Woodruff, L. L., and Spencer, H.: Conjugation, 479; Infusorian Food Reactions, 297
Woods, E.: See Sherman, H. C.
Woodward, H. E., and Alsberg, C. L.: Amine Separation, 173
Woodward, T. E.: See Tocher, J., F.
Woodwell, M. N.: See Barach, C. W.

Woodwell, M. N.: See Means, J. H.
Woodwell, M. N.: See Smith, L. W.
Woodyatt, R. T.: Diabetic Diet, 443
Wrede, F.: Disaccharide Derivatives of S and Se, 473: Sulphur and Selenium Sugars, 8
Wright, A. E.: Intertraction, 221
Wright, Sir A. E., and Colebrook, L.: Review, 545
Wright, F. C.: Metabolism of Adolescents, 65
Wright, F. R.: See Hubbard, R. S.
Wright, K. D.: See Hooper, C. W.
Wright, R. C.: Soil Nitrogen, 344
Wright, R. C., and Harvey, R. B.: Potato Freezing, 532
Wright, S.: Correlation, 530; Vitamin and Appetite, 634
Wright, W. H.: See Fred, E. B.
Wu, H.: See Aub, J. C.
Wundsch, H.: Temperature and Food on Growth, 300
Wurmser, R.: Light on Chlorophyll, 289
Wurmser, R., and Duclaux, J.: Photosynthesis in Algæ, 289
Wuth, O.: Acetonitrile Toxicity, 527
Wyant, Z. N.: Soil Bacteria, 346
Wybauw, R.: Auricular Fibrillation and Quinidine, 257
Wyon, G. A.: See McLeod, J. W.
Wyss, O.: Shape of Red Cells, 366

Yamaguchi, I.: Rice Flower and Seed, 165, 166
Yamada, M.: Infusion in Portal Vein, 502
Yamakita, M.: Blood in Infections, 598
Yamane, J.: Horse Semen, 275, 640
Yano, T.: Metabolism of Japanese Infants, 141
Yates, A. B.: Spinal Section and B.-P., 500
Yatsu, N.: Heterosexual Parabiosis, 276
Yoder, L.: See Dox, A. W.
Yorke, W., and Macfie, J. W. S.: Paroxysmal Hæmoglobinuria, 334
Yoshimura, S.: Eel Extract, 349
Young, E. G.: See Grey, E. C.
Young, F. D.: Frost and Plants, 233
Young, I. M. de: See McKellips, G. M.
Young, W. J.: Melanin from Skin, 240
Ythier, L.: See Carrieu,

Zaleski, I. A., and Sachnovska, A. A.: Blood Urate, 130
Zande, F. v. d.: Blood-Film Oxidases, 301
Zandrén, S.: Stalagmones, 270; Pineal Body, 521
Zeckendorf, K.: See Kerb, J.
Zeijdner, J.: See Leewen, W. S. v.
Zeleny, C.: Mutation, 411
Zeller, H.: Blood-Platelets, 255
Zellner, J.: Fungus Chemistry, 532
Zerner, E., and Hamburger, R.: Ag Salts on Yeast, 648
Zeyner, R.: Tyrosin Haloid Derivatives, 297
Zibordi, D.: Eosinophile Cells, 482
Ziegenspeck, N.: Amyloid in Plants, 159
Zielstorff, W.: Manures, 602
Zijp, C. van: Hexamethylenetetramine and Plants, 164
Zilva, S. S., and Drummond, J. C.: Fish-Liver Oils 508
Zilva, S. S.: Oxidation of Vitamins, 140; Ozone on Vitamins, 60
Zilva, S. S., and Miura, M.: Vitamin, 633; Vitamins, 436
Zilva, S. S., and others: Fat Vitamins, 59; Rickets, 435
Zilva, S. S.: See Drummond, J. C.
Zilva, S. S.: See Harden, A.
Zimmermann: See Koekel.
Zinck, R. H.: See Clark, H. M.
Zizine: See Chauffard, A.
Zoller, H. F.: Casein Viscosity, 296
Zoller, H. F.: See Okuda, Y.
Zollikofer, C.: Light on Plants, 462
Zondek, B.: Body Temperature, 68; Large Intestine Peristalsis, 137; Thermometry, 205;
Zondek, B.: See Stickel, M.
Zondek, H.: Heart and Endocrines, 74
Zondek, H.: See Loewy, A.
Zondek, S. G.: Convallaria Standardisation, 525; Heart Perfusion, 500; Heart Poisons and K and Ca, 42, 87; Ionic Equilibrium, 499; Ions and Toxicity, 593; Potassium and Radioactivity, 500
Zotterman, Y.: Acid and Nerve Endings, 181
Zucker, T. F.: P and Ca Excretion, 517
Zucker, T. F.: See Pappenheimer, A. M.
Zuckmayer, F.: Silicic Acid Elimination, 209
Zumbusch, H.: See Stepp, W.
Zunz, E.: Digestion Co-ordination, 372; Thymus and Thyroid, 71; Thyroid Composition, 325
Zunz, E., and Geertruyden, M. van: Anaphylaxis, 190; Hirudin and Anaphylaxis, 36
Zunz, E., and Geertruyden-Bernard, M. van: Anaphylaxis, 190
Zunz, E., and Govaerts, P.: Anaphylaxis, 529; Anaphylatoxins, 393; Hæmorrhagic Shock, 597
Zwaardemaker, H.: Heart and Radiations, 428; K and Uranium for Heart, 312; Odours, 420;- Radio-Activity and Hormones, 628; Radio-Physiological Paradox, 258

Book Reviews.

Abderhalden, E.: Biologischen Arbeitsmethoden, 545
American Journal of Hygiene, 106
Archiv für (Anatomie und) Physiologie, 106
Artschwager, E., and Smiley, E. M.: Botanical Equivalents, 347
Asher, L., and Spiro, K.: Ergebnisse der Physiologie, 106, 466
Bayliss, W. M.: General Physiology, 168
Boothby, W. M., and Sandiford, Irene: Basal Metabolism, 104
Brachet, A.: Embryologie des vertébrés, 608
Brown, W. H.: Philippine Mountains, 106
Burns, D.: Biophysics, 545
Burton, E. F.: Colloids, 466
Carpenter, T. M.: Respiration Tables, 465
Cathcart, E. P.: Protein Metabolism, 105
Chemical Society, Annual Report, 105
Clarke, R. H., and Henderson, E. E.: Central Nervous System, 105
De Souza, D.: See Lyle, H. W.
Euler, H.: Chemie der Enzyme, 399
Fischer, M. H.: Œdema, 467; Soaps and Proteins, 467
Gatenby, J. B.: See Lee, A. B.
Henderson, E. E.: See Clarke, R. H.
Hess, A. F.: Scurvy, 106
Japan Medical World, 400
Langeron, M.: Précis de microscopie, 400
Langley, J. N.: Autonomic Nervous System, 650
L'Année Biologique, 347
Lasareff, P.: Théorie ionique de l'excitation, 346
Lee, A. B., and Gatenby, J. B.: Microtomist's Vade-Mecum, 400
Lumière, A.: Colloides chez les êtres vivants, 399

Lyle, H. W., and de Souza, D.: Manual of Physiology, 607
Martindale, W. H., and Westcott, W. W.: Extra Pharmacopœia, 233
McCarrison, R.: Deficiency Diseases, 292
Mellanby, E.: Experimental Rickets, 545
Meltzer Number of Proc. Soc. Exp. Biol. and Med., 466
Michaelis, L.: Praktikum der Physikalischen Chemie, 292
Milroy, J. A., and Milroy, T. H.: Physiological Chemistry, 544
Milroy, T. H.: See Milroy, J. A.
Moore, B.: Biochemistry, 399
Myers, V. C.: Blood Analysis, 168
Opitz, R. B.: Practical Physiology, 104
Oppenheimer, C.: Der Mensch als Kraftmaschine, 233
Panconcelli-Calzia, G.: Experimentelle Phonetik, 233
Paton, D. Nöel, and others: Practical Physiology, 292
Physiological Reviews, 105
Plimmer, R. H. A.: Analyses and Energy Values of Foods, 399
Ranson, S. W.: Anatomy of Nervous System, 168
Roaf, H. E.: Biological Chemistry, 466
Robertson, T. B.: Principles of Biochemistry, 399
Sandiford, Irene.: See Boothby, W. M.
Schmitz, E.: Chemical Physiology, 106
Smith, F.: Veterinary Physiology, 465
Spiro, K.: See Asher, L.
Westcott, W. W.: See Martindale, W. H.
Wiesner, J.: Botany, 106
Wright, Sir A. E., and Colebrook, L.: Capillary Technique, 545

Obituary Notices.

Bainbridge, F. A., 546
Cow, D. V., 347
François-Franck, 468
Galeotti, G., 400
Leyton, A. S. F., 468
Mann, G., 468
Menzies, J. A., 348

INDEX OF SUBJECTS

Abderhalden Reaction (Grönberg), 93; (Herzfeld and Klinger), 175; (Meyer), 236; (Abderhalden), 450
Abdominal Muscle, Tone of (Bruns), 53
Abscission Tissue in Branches (Greguss), 164
Absorption by Peritoneum (Clark), 134
— of NaCl (Cobet), 198
— of Water in Plants (Nordhausen), 164; (Ursprung and Blum), 164
Acapnia Theory (Henderson and others), 431
Accommodation (Loeb), 250
Acerin (Anderson and Kulp), 285
Acetaldehyde and Acetone Estimation (Stepp and Fricke), 610
— in Diabetes (Stepp and Lange), 66; (Stepp and Feulgen), 322
— in Urine (Fricke), 516
Acetic Acid Intoxication (Sollmann), 155
Aceto-Acetic Acid Oxidation by $KMnO_4$ (Engfeldt), 8
Acetone Action (Salant and Kleitman), 330
— and Aldehyde Estimation (Stepp and Engelhardt), 8
— Bodies, Formation (Schaffer), 443
— Excretion by Lungs (Briggs and Schaffer), 631
— in Cerebro-Spinal Fluid (Koopman), 252
— Pharmacology (Sollmann), 84
— Test (Citron), 145; (Pittarelli), 146
Acetonitrile and Thyroid (Wuth), 527
Acetyl Choline in *Capsella* (Boruttau and Cappenberg), 337
Acid Fuchsin Convulsions (Thomas), 390
Acidosis (Bayliss), 135; (Evans), 497
— Acid-Base Balance (Van Slyke), 598
— and Blood CO_2 (Means and others), 157
— Diabetic (Calvert and others), 143; (Lauritzen), 207
— from Capillary Poisons (Wallace and Pollini), 155
Acids, Physiological Action (Philippson and Hannevart), 22, 119
— Toxicity to Infusoria (Collett), 353, 354
Acquired Characters (MacBride), 3
Acridine Derivatives, Action (Lenz), 217
Acriflavine Antisepsis (Browning and Gulbransen), 217
Adaptation (Crozier), 17, 402, 412
— of Dunaliella (Labbé), 241
Adipose Tissue, Composition (Schirmer), 301
Adiposity. See Pituitary, Thyroid, etc.
Adiposo-Genital Syndrome and Diabetes Insipidus (Camus and Roussy), 383
Adonis vernalis Action (Schmidt), 81
Adrenaline and Arterio-Sclerosis (Kiyono and Higashihara), 221
— and Atheroma (Marabotto), 89
— and Blood Pressure (Hess), 583; (Izquierdo), 584
— and Gastric Secretion (Hess and Gundlach), 148
— and Growth (Bilski), 583
— and Heart Drugs (Gruber), 154
— and Hyperthyroidism (Peabody and others), 274
— and Glucose Administration (Beumer), 274
Adrenaline and Liver (Stübel), 147
— and N Metabolism (Brel), 638
— and Respiration (Roberts), 584
— and Sympathetic Tone (Lehmann), 274
— and Tetanus Toxin (Tawara), 457
— Depressor Action (Collip), 274
— Diabetes (Achard and others), 379; (Bardier and others), 379; (Tatum), 379
— Effect on Blood (Hubbard and Wright), 212
— — on Capillaries (Kukulka), 71
— Effects in Man (Porak), 72
— Estimation (Autenrieth and Quantmeyer), 425
— — in Blood (Sepulveda), 71
— Fibrillation and $CHCl_3$ (Heinekamp), 72
— Hyperglycæmia (Bornstein), 273; (Tatum), 520, 584
— Injections, Effects (Bjure and Svensson) 583; (Csépai), 584
— Leucocytosis (Walterhöfer), 327
— Output by Physostigmine (Stewart and Rogoff), 273
— — in Dogs, etc. (Stewart and Rogoff), 273
— Papaverine Antagonism (Csépai), 274
— per Rectum (Barbour and Rapoport), 418; (Hoskins), 584
— Pilocarpine Antagonism (Billigheimer), 82
— Preservation (Richard and Malmy), 584
— Quinine Antagonism (Clerc and Pezzi), 82
— Reversed Action (Amsler), 147
— Sensitivity after Chloral (Bardier and Stillmunké's), 274
— Sugar Mobilisation (Boothby and Sandiford), 207
— Trendelenburg Method (Alday-Redonnet), 71
— Vasoconstriction (Meltzer and Auer), 273
Adrenalone (Jaeger), 643
— Effects (Jaeger), 454
Adsorption (Mathews), 611
— by Charcoal (Hartleben), 173; (Herbst), 173; (Horst), 219; (Herbst), 350
— by Filter Paper (Scheringa), 7
— by Fuller's Earth (Clowes and others), 173
— of Drugs (v. Leeuwen and Zeijdner), 280, 282
— of Proteins, etc., by Charcoal (Abderhalden and Foder), 11
Aerobic and Anaerobic Growth (Grey and Young), 286; (Raistrick and Clark), 287
Afferent Path, Pupil in Lesions of (Byrne), 249
After-Images, Complementary (Juhász), 27
Agglutination and Isoelectric Point of Red Corpuscles (Coulter), 34
— and Protein Reactions (Szent-Györgyi), 173
— and Sedimentation (Starlinger), 254
— Auto-hæmagglutination (Bond), 34
— by Ricin (Gunn), 220
— of Bacteria (Vorschütz), 129
— of Red Corpuscles (Schütze), 34
Agriculture in Utah (Harris and Butt), 530
— Research (Anon.), 530
Air Analysis (Boothby and Sandiford), 169
— — Methods (Guthrie), 609
— Dustiness of (Spencer), 1

Albuminuria, Postural (Harrison), 598
Albumoses in Blood and Exudates (Achard and Feuillié), 311
Alcaptonuria and Acetone (Katsch), 268
Alcohol, Action (Ducceschi), 330
— and Skilled Work (Jöttermann), 80
— and Spermatogenesis (Kostitch), 278
— Caffeine, and Nicotine, Toxicity (Macht and Bloom), 390, 391
— Chronic Effects (Sollmann and others), 84
— Effect on Progeny (MacDowell), 217
— in Cerebro-Spinal Fluid (Carrieu and others), 493
— in Rest and Work (Viale), 524
— Intravenous, as Narcotic (Nakagawa), 452
— on Heart (Patania), 428
Alcoholic Fermentation (Warden), 600
— — and Pressure (Rippel), 160
— — Salt Effect (Harden and Henley), 339
Alcohols, Toxicity (Macht), 84
— Unsaturated, in Plants (Franzen and Wagner), 223
Aldehyde and Acetone Estimation (Stepp and Engelhardt), 8
Aldehydes in Fermentation (Kumagawa), 647
Aldol in Urine (Fricke), 516
Alfalfa Growth (Stewart), 542
Algæ Cultures (Wettstein), 601
— Ecology (Andersen), 542
— Salts (Lapique), 458
Alimentary Canal, Co-ordination (Zunz), 372
— — Sensibility (Fischl), 52
Alkali Reserve. See Plasma Bicarbonate, and Blood
Alkaloid of *Sinomenium* (Ishiwari), 286
Alkaloidal Poisoning (de Laet), 281
Alkaloids in Plants (Ciamician and Ravenna), 284
— on Heart (Hanzlik), 590
— Spectrum (de Laet), 281
Alkaptonuria (Katsch and Nemet), 445
Alkyl Chlorides on Heart (Kiessling), 219
Allyltheobromine (Heymans), 388
— as Diuretic (Heymans), 332
Alpinism (Barcroft), 315; (Bayeux), 315
— Physiology of (Schneider; Bayeux), 631
Alveolar Carbon Dioxide after Meals (Bennett and Dodds), 572
— — — and Meals (Dodds), 195; (Dodds and Bennett), 195
Amaurotic Idiocy (Marinesco), 334
Ambard Constant (Ide), 267; (Herman), 518
Amines, Pharmacology of (Hanzlik), 387
— Separation of (Woodward and Alsberg), 173
Amino-Acid Derivatives (Hugounenq and Florence), 406
Amino-Acids and Polypeptides (Pohlmann), 475
— and Tubercle (Masucci), 98
— etc., as Ampholytes (Eckweiler and others), 12
— from Lactalbumin (Jones and Johns), 612
— in Blood (Schweriner), 38; (de Snoo), 188; (Abderhalden), 311;
— in Intestine (Abderhalden), 317
— in Nutrition (Sure), 199, 321
— Methylated (Ackermann and Kutscher), 86
of Feeds (Hamilton and others), 610
— Oxidation by Charcoal (Warburg and Negelein), 175
— Separation (Buston and Schryver), 610
— Urinary (Blum), 67
Amino-Alcohols as Anæsthetics (Cano and Ranedo), 278
Aminoethyl Alcohol (Fourneau and Gonzalez) 613,
Amino-Malic Acids (Dakin), 550
Aminovaleric Acid in Proteins (Abderhalden and Kürten), 409
Amitosis in Bone (Bast), 413
Ammonia and Amines, Separation (Franzen and Schneider), 476
— in Pregnancy (Cullis and Hewer), 79
— Toxicity (Hugounenq and Florence), 334
Amnion, Mitochondria (Emge), 616
Amœba, Food Reactions (Kepner and Whitlock), 14
Amœbæ, Serology of (Schuckmann), 113
Amœboid Movements (Loeb), 177, 243, 481
Amylase (Biedermann), 297; (Biedermann Maestrini, Isawa), 408; (Sherman), 613; (Olsson), 613
— Activity (Euler and Svanberg), 112
— and Salts (Rothlin), 551
— Characters (Euler and Svanberg), 353
— Co-Ferments (Biedermann), 13
— Effect of Salts on (Hahn and Michalik), 112; (Hahn), 113
— Estimation (Oshima), 94; (Ambard), 240
— only produced by Cells (Teschendorf), 113
— Pancreatic, Effect of NaF (Lang), 241
— — — of Organic Bases (Desgrez and Moog), 113
— Poisoning of (Olsson), 477
Amyl Nitrite, Effects (Richard), 332
Amyloid in Plants (Ziegenspeck), 159
— Origin of (Frank), 598
Amylopectine (Mayer), 237
Anæmia, Alimentary (Brinchmann), 597
— and Spleen (Householder), 387
— Blood CO_2 in (Peters and others), 135
— Circulation in (Morawitz and Denecke), 570
— Pernicious, and Splenectomy (Giffin and Szlapka), 89
— — Blood in (Ashby), 425
— Red Marrow in (McMaster and Haessler), 617
— Saponin (Firket), 594
— Secondary (Evans), 309
Anaerobiosis and Glycogen (Berkeley), 299
Anæsthesia, Synergistic Colonic (Gwathmey), 80
Anæsthesin (Morgenroth), 278
Anæsthetic, New (Wallis and Hewer), 329
Anæsthetics (Wallis and others), 451
— Absorption from Genito-Urinary System (Macht), 144
— Action on Protoplasm (Heilbrunn), 18
— and Respiratory Centre (Trevan and Boock), 136
— Local (Launoy and Fujimori), 79
— — Effect on Nerves (Uyeda), 360
Anaphylatoxins, Agar and Hirudin (Zunz and Geertruyden), 36
Anaphylaxis, Alimentary (Kopaczewski), 335
— and Agglutinins (Arloing and others), 335
— and Chemiotaxis (Metalnikow), 335
— and Desensitisation (Lumière and Couturier), 88
— and Hirudin (Zunz and Geertruyden-Bernard), 190
— and Immunity (Arthus), 91; (Dale and Kellaway), 155; (Klinkert), 284
— and Plasma Bicarbonate (Eggstein), 455, 456
— — Colloids (Sachs and Oettingen), 190
— and Platelets (Zunz and Govaerts), 529
— and Precipitation (Lumière and Couturier), 528
— and Pregnancy (Lumière and Couturier), 283
— and Surface Tension (Lumière), 156; (Kopaczewski), 156; (Kopaczewski), 283; (Lumière), 283; (Kopaczewski), 528
— Blood in (Waele), 392
— History of (Anon.), 108
— in Bacteria (Richet and others), 155

Anaphylaxis, Inverted (Forrsman), 88
— Liver in (Manwaring), 528
— Lung in (de Waele), 334
— of Heart (Heymans), 429
— Plant (Lumière and Couturier), 543
— Review (Wells), 93
— Simulation of (Lumière and Couturier), 88
— to Antipyrine (Widal and Vallery-Radot), 156
— Various (Several authors), 392, 393
Anencephalic Syndrome and Pituitary (Browne), 73
Aneurysm, Bruit (Lian and Welti), 629
Aniline Inhalation (Jaffé), 85
Anoxæmia and Nervous Symptoms (Walshe), 372
— and Oxygen Administration (Adams and Morris), 136
— Heart in (Greene and Gilbert), 427, 431; (Haggard), 431
— in Cat (Doi), 316
— See also Oxygen Lack
Anthochlor (Klein), 223
Anthocyan Formation (Kohler), 458
Anthocyanins (Schudel), 336
—and Anthocyanidins (Everest and Hall), 285
Anthocyans, Origin (Kohler), 530
— Rôle (Jonescu), 530
Antibodies (Huntoon and others), 91
— Distribution in Blood (Sordelli), 130
— Formation (Maisin), 90
— of Mother and Offspring (Reymann), 130
— to Fats, etc. (Schmidt), 92
Antibody and Antigen (Mackenzie and Leake), 283
Antigens (Landsteiner), 457
Antihæmolysins and Non-Lipoids (Clark and others), 598
Antiplatelet Serum (Govaerts), 529
Antipyretic Drugs and Blood Composition (Barbour and Herrmann), 589
Antipyretics and Behaviour (Macht and Bloom), 127
— as Local Anæsthetics (Rhode), 590
Antiscorbutic Fodder (Hess and others), 60, 61; (Dutcher and others), 61
— Rhubarb as (Pierson and Dutcher), 60
Antiscorbutics (Various), 510-11
— Potato (Bezssonoff), 61
Antiseptic Action and Composition (Browning and others), 79
— Aromatic Fumes (Macht and Kunkel), 152
— Hg as (Joachimoglu), 645
Antiseptics, Testing of (Browning and Gulbransen), 217
Antitoxine, Diphtheria (Kraus and Sordelli), 156
Autolysis (Nagagawa), 477
Autoxidisable Cell Substance (Hopkins), 301
Aphasia (Head), 169; (Noica), 418
Aphis Eggs, Hatching (Peterson), 354
Apnœa, Deglutition (Clark), 195
— Vagal (Meek), 194
Apple Anatomy (Kraus and Ralston), 342
— Physiology (Butler and others), 98
— Spur and Fruit (Roberts), 166
— Spurs, Composition (Hooker), 98
— Storage Diseases (Brooks and others), 104
Apples, Fruitfulness in (Wiggans), 102
— Injury to (Anon.), 606; (Tayler), 649
Aqueous Humour, Glucose of (Haan and Creveld), 623
— — Reaction (Nordenson), 561
Arginase, Dynamics (Gross), 102
— of Tissues (Fuchs), 241
Argyll-Robertson Pupil (Wilson), 490
Arginine and Histidine, Action of HNO_2 (Sekine), 12
Arsenic, Chemotherapy (Raiziss and others), 281
Arsenic, Colloidal (Külz), 333
— Effect on Bones (v. Eeckhoüt), 589
— Micro-Estimation (Ramberg and Pregl), 296
— Poisoning (Sollmann), 594
— Sulphide, Effects (Meneghetti), 536
Arsenical Drugs, Meningeal Permeability (Smith and Voegtlin), 365
— Poisoning (Meneghetti), 153
— — Industrial (Slosse), 282
— — $MgSO_4$ as Antidote (Hansen), 282
Arsenobenzene, Shock after (Flandin and Tzanck), 644
Arsenobenzenes, Galyl (Myttenaere), 388
— Toxicity (Myttenaere and others), 281
Arsinite, Disodium Ethyl, as Spirochæticide (Nichols), 282
Arsphenamine, Ag-Na (Dyer), 388
— etc. (Hooper and others), 595
— Injection (Voegtlin and Smith), 526
— Neo, Toxicity (Raiziss and Falkov), 220
— Preparations (Voegtlin and Smith), 152
— Toxicity (Reid Hunt), 219
Arterial Pressure and Volume (Marassini), 371
— — at Climacteric (Schlesinger), 384
— — during Operation (McGlannan), 370
— — in Exercise (Chailley-Bert and Langlois), 258
— — in Retina (Duverger and others), 124
— — Mean (Pachon), 258
— — Method (Blankenhorn), 370
— — on Fluid Food (Miller and Williams), 258
— — Waves (Mougeot and Petit), 371
Arteries, Blood Flow in (Thoma), 429
— Structure (Aihara), 482
Arterio-Sclerosis, Alimentary (Murada and Katsaka), 597
— and Adrenalin (Kiyono and Higashihara), 221
Artery, Polar Excitation (Liebermann), 629
Artificial Respiration in New-Born (Greenwood), 259
— — Pump (Gunn), 170
Ash Morphology, Plant (Molisch), 222
Asparagus as Food (Juquelier), 633
Aspergillus, Acids formed (Elfving), 162
— Auto-Intoxication (Boas), 162
— Conidia (Boas), 161
— Perithecia (Sartory), 161
Assimilation by Plants (Ravenna), 164; (Kögel), 164; (Bokorny), 164; (van Zijp), 164
— Chlorophyll and Light (Wurmser), 289
— in Plants (Mazé), 290, 540; (Ruttner), 649
— — and Light (Stålfelt), 602; (Lundegårdh), 603; (Henrici), 603
Astragalus, Histology (Ritter), 336
Astringents and Tannin (Sollmann), 152
Atheroma and Adrenalin (Marabotto), 89
Atropine, Effects on Stomach (Hecht), 454
— from Datura (Rhodehamel and Stuart), 600
— Glycosuria (Rossi), 515
— Immunity of Rabbit (Heyde), 527
— on Circulation (Harris), 279
— on Heart-Rate (McGuigan), 279
— Serum Synergism (Kirste), 331
Attention, Fluctuation of (Dodel), 623
Auditory Fatigue (Flügel), 28
Auricle, Circus Movement (Lewis and others), 312
— Effect of Drugs (Gruber), 154
— — of Vagus (Lewis and others) 191; (Drury and others), 191
— Excitation of (Drury and Lewis), 131
Auricular Fibrillation (Wybauw), 257; (Thomas), 257; (Various authors), 628
— — Quinidine in (Drury and others), 498

Auricular Flutter and Fibrillation (Lewis), 191, 203
— — and Vagus (Wilson and others), 569
Auriculo-Ventricular Bundle (Holmes), 498; (Smith), 569
Autolysis, Brain (Gibson and others), 418
— of Cell Granules P.M. (Freiburg), 116
— of Granula (Oka), 355
— of Liver (Morse), 406
Automatism in Man (Schwartz and Meyer), 417; (Pinkhof), 417
— in Plants (Wildeman), 601
— of Dependent Organs (Hofmann), 20
Auto-Noxines (Collier), 393
Aviation, Medical Studies (Henderson), 49
Azo-Dye from Bilirubin (Fischer and Barrenscheen), 351
Azotobacter, growth on Peat (Schmidt), 229

Bacillus bruntzii, Pigment Formation (Nepveux), 229
Bacteria Chemistry (Grimmer and Wiemann), 339
— Growth (Graham-Smith), 230; (Karczag), 640
— Heat Production (Shearer), 340
— Morphology (Bergstrand), 229
— Soil, Growth of (Noyes and others), 98
— Sulphide (Meyers), 229
Bacterial Vitamins (Thjotta and Avery), 341
Bactericidal Substances (Paolucci), 529
Bacteriolysis (Gratia), 335
Bacteriophages (Bruynoghe), 393
Barfoed's Reagent (Roaf), 170
Barium, Effect on Heart (de Boer), 192
— Meal for X Ray (Lenk), 170
Barley Flowers (Harlan), 541
Basal Metabolism (Means and Woodwell; Benedict; Almeida; Lusk), 437
— — and Cooling Power (Campbell and others), 440
— — and Liver (Aub and Means), 438
— — Apparatus (Tihen), 65; (Bailey), 470
— — CO_2 Method (King and Pearl), 578
— — in Diagnosis (Boothby), 65
— — in Fever (Du Bois), 438
— — in Menstruation (Wiltshire), 438
— — Methods (McCaskey), 203; (Harris and Benedict), 203; (Boothby and Sandiford), 203
— — of Boys (Baumgardt and Steuber), 68
Baths, Hot (Bazett and Haldane), 324
Bean, Diseases (McRostie), 605
— Foods (Finks and others), 434
— Proteins as Food (Johns and Finks), 262
Beats, Sensation of (Kreidl and Gatscher), 492
Becquerel Rays, Effects (Engelmann), 117
Bee, Flora of (White), 15
— is Colour-Blind (Hess), 15
Beet Disease (Molz), 544
— Growth of (Greisenegger and others), 99, 100, 103; (Hamous), 601
Behaviour and Drugs (Macht and Bloom), 127
Belladonna Standardisation (Leeuwen and Maal), 643
Bence-Jones Proteinuria (Walters), 158; (Hektoen), 209; (Micheli), 518; (Miller and Sweet), 581
Benzene and Cyclohexane, Action (Launoy and Levy-Bruhl), 83
— Effects (Cameron and Sedziak), 184
Benzyl Benzoate and Leucocytes (Emge and Jensen), 525
— — Pharmacology (Mason), 83
— Derivatives (Nielsen and Higgins), 331
— — and Cinnamein (Macht), 331
Beri-Beri, Glyoxalase in (Findlay), 264
— Avian (Findlay), 202
Bicarbonate, Blood and Lymph (Reiman and Sauter), 330
Bicycle Ergometer Balance (Schuster), 108
Bilateral Reactions (Terashi), 559
Bile Acids (Wieland and Schulenburg), 240; (Borsche and others), 477
— — Estimation (Schmidt and Dart), 109
— and Stomach Emptying (Pannett and Wilson), 198
— Duct Obstruction (Friese), 198; (Brulé), 199
— — Sphincter (Reach), 576
— Effect on Spinal Reflexes (Rossi), 122
— — on Uterus (Okamoto), 384
— Flow (Crohn and others), 373; (Kahn), 373
— Infant's (Grego), 137
— Lyon Technique (Dunn and Connell), 505
— Secretion in Man (Brunacci and Noferi), 433; (Robitschek and Turolt), 433
— White (Gosset and others), 506
Bilirubin Diazo-Reaction (Fischer and Barrenscheen), 351
— Formation (Schilling), 576
— in Serum (Thannhauser and Andersen), 610; (Meulengracht), 610
— of Serum (Botzian), 39
Biloidanic Acid (Schenck), 9
Biochemistry (Forster), 469
Biology and Physics (Hill), 235
Bismuth for Syphilis and Trypanosomiasis (Sazerac and Levaditi), 454
Black Spider Poisoning (Louis), 282
Bladder, Sensory Impulses (Riddoch), 126
— Tonus and Temperature (Roskam), 62
Blepharospora, New Species (Peyronel), 168
Blind Spot (Michailesco, Gradle), 562
Blood, Acid-Base Balance (Van Slyke), 598
— — Exchange (Collip), 196
— after Liver Extirpation (Mann and Magath 188
— after Pilocarpine (Bornstein and Vogel), 389
— after Splenectomy (Hall), 367
— Alkali Reserve (Collip), 196
— — — after Morphine (Gauss), 153
— — — and Diet (Forbes and others), 511
— — — in Infection (Hirsch), 93
— — — in Influenza (Hachen and Isaacs), 93
— — — in Peritonitis (Willis), 93
— Alkalinity Regulation (Haldane), 424
— Amino-Acids (Snoo), 368; (Costantino), 368
— Ammonia of, and Neutrality (Nash and Benedict), 626
— and Lymph Bicarbonate (Reiman and Sauter), 330
— and Narcotics (Meier and Krönig), 431
— Antigens (Meyer), 598
— Apparatus for Sampling (Hart), 4
— Ascidian (Fulton), 479
— Azurophil Granules (Betances), 554
— Bicarbonate (Reiman), 330
— Bilirubin Content (Haselhorst), 130
— Calcium (Richter-Quittner), 189; (Mason), 368
— — and Coagulation (Vines), 309
— — Balance (Clark), 253; (Richter-Quittner), 254
— — Estimation (Kahn and Hadjopoulos), 311; (Thro and Ehn), 311; (Cristol), 311; (Weiss), 568
— Carbohydrate (Cammidge and others), 270
— Carbon Dioxide and Cl of (Mukai), 568
— — in Disease (Means and others), 157
— — and Oxygen (Henderson and Haggard), 47
— — — Carriage (Van Slyke), 47; (Peters and Barr), 47; (Smith and others), 47
— — — Curve (Peters and others), 135
— Cell and Bacteria Counts (Dreyer), 470
— Cells after Transfusion (Bulliard), 253
— — Development (Sabin), 554

Blood Cells Reticulum (Cowdry), 117
— Charcot Crystals (Liebreich), 565
— Chloride (McLean and others), 33; (Rasznyák), 39; (Wetmore), 39; Denis and Sisson), 318; (Samson), 368; (Scheer), 426
— — and Clotting (Falte and Richter-Quittner), 187
— — Distribution (Creveld), 626
— — in Diabetes (Wilder and Beeler), 207
— — in Disease (Jacobsen and Palsberg), 335
— — in Oxidised and Reduced (Brown and Hill), 130
— Cholesterol (Richter-Quittner), 189
— Clot, Retraction (Opitz and Matzdorff), 254
— Coagulation (Hütten), 367; (Mills and others), 367; (Gelera), 497; (Various), 567
— — after Splenectomy (Wühlisch), 188
— — and Antithrombin (Doyon), 310
— — and Hæmorrhage (Hanzlik), 36
— — and Liver (Tichy), 310
— — and Morphine (Doyon), 37
— — and Nucleins (Doyon), 37
— — and Nucleoproteins (Doyon), 296
— — and Phosphated Plasma (Nolf), 36
— — and Platelets (Roskam), 254
— — and Reaction (Ross), 187
— — and Salt Infusions (Schenk), 37
— — and Spleen (Nonnenbruch and Szyszka), 36; (Stephen), 89; (Wöhlisch), 424; (Ohara), 497
— — and X Rays (Szenes), 188
— — Clinical (Morawitz), 36
— — Complex (Vines), 424
— — Conditions (Mason), 36
— — Factors (Heller), 625; (Doyon), 626
— — Hasteners (Nonnenbruch and Szyszka), 279
— — Physico-Chemical (Atzler and Döhring), 37
— — See also Hæmophilia
— — Study of (Fonio), 187
— — " Thermal Changes " (Gayda), 636
— — Thromboplastic Substances (Szenes), 129
— — Time (Geers), 367
— — — Method (Inchley), 625
— — Tissue Extracts (Mills), 187, 332
— Composition in Anæmia (Peters and Rubnitz), 49
— Concentration after Sweating (Willbrand), 368
— Corpuscles and Bacteria, Enumeration (Dreyer), 4
— — and Spleen (Howard and Soler), 33
— — and Ultraviolet (Traugott), 37
— — See Red Cells
— Corpuscular Volume and Hb (Gram), 308
— Defibrinated, Pharmacology (Freund), 84
— Destruction (Ashby), 425
— — in Placenta (Schick), 215; (Wagner), 215
— Detection in Fæces (Eck), 369
— Diastase (Davis and Ross), 269; (Karsner and others), 515
— Distribution of Water (Takei), 186
— Diurnal Hb Changes (Dreyer and others), 33
— Effect of Iodine (Dorlencourt and others), 386
— — of Light (Aschenheim and Meyer), 625; (Baumann), 625
— — of Low Pressure Atmospheres (Sundstroem and Bloor), 38
— Equilibria in (Henderson), 259
— Fat after Feeding (Atkinson), 368
— Fats and Lipoids (Lemeland), 309
— Fe and O_2 Capacity (Engelkes), 260
— Fibrin (Gram), 566
— Fœtal and Maternal Exchanges (Piccoli), 150
— Formation at High Altitudes (Kestner), 130
— — in Anæmia (Jaffé), 627
— Gas Apparatus (Parsons), 294
— Gases of Arterial (Meakins), 49
Blood, General Properties (Lucas), 425
— Glycolysis (Koning), 442; (Mauriac), 636
— Grouping, Tests in (Ottenberg), 497
— Groups and Disease (Buchanan and Higley), 625
— Hb and Red Count (Harvey), 33
— in Dyspnœa (Adair), 315
— in Pregnancy (Killian and Sherwin, Caldwell and Lyle), 450
— in Pyloric Obstruction (Hastings and others), 197
— in Renal Disease (Watanabe), 517
— Inorganic Contents (Jones and Nye), 426
— Intestinal Excitants (Pellegrini), 582
— Ionic Interchange (Doisy and Eaton), 431
— Lipæmic (Feigl), 189
— Lipoid Balance (Bloor), 189; (Feigl), 189
— Lipoids after Injections (Gabbe), 568
— N after Food (Corinaldesi), 267
— — and Uræmia (Höst and Hatlehol), 597
— — in Nephritis (Williams), 568
— — on Fluid Diet (Miller and Williams), 258
— Nitrogen (Feigl), 188
— Non-Protein N (Stehle), 38; (Williams), 368; (Kennaway), 471
— Oxygen Dissociation in Fevers (Yamakita), 598
— Occult (Various authors), 497
— — in Fæces (Adler), 190
— of Bombyx (Kawase and others), 242
— of Frog, Composition (v. d. Heyde), 321
— Oxygen Determination (Smith and others), 49
— — Pressure in (Barcroft and Nagahashi), 572
— Peptone Injection on (Seeliger and Gorke), 566
— Phosphate (Lehman), 626
— — Distribution (Iversen), 189
— — Estimation (Bloor), 610
— Phosphates (Feigl), 40
— — in Lipæmia (Bloor and Farrington), 38
— Phosphoric Acid (McKellips and De Young), 188
— Phosphorus (McKellips and others), 368
— — in Cancer (Gröbly), 283
— Picture after Ca Injection (Rösler), 255
— — of Embryo (Bétances), 301
— Pictures, Abnormal (Boccadoro), 495
— Pigments and Bacteria (Kammerer), 92
— Pigments (Sawa), 497
— Plasma Buffers (Evans), 424
— — Ca and Mg Estimation (Kramer and Tisdall), 109
— — Colloid Stability (Sachs and Oettingen), 190
— — Dialysate (Mestrezat) 496
— — Flocculation, (Starlinger), 626
— — for Embedding (Baitsell), 294
— — Volume (Bock), 128
— Platelets (Riess), 495; (Castronuovo, Polettini), 496
— — and Coagulation (Roskam), 254, 310
— — Origin (Schilling), 255
— — Types (Zeller) 255
— Potassium Content (Myers and Short), 130
— — Na, Ca, Mg in (Kramer and Tisdall), 548
— — of (Meyers and Short), 568
— Preservation (Ambard), 52
— Pressure and Brain (Rogers), 25
— — and Kidneys (Monakow), 45
— — and Stomach Tube (McKinlay), 133
— — Apparatus (Dirken), 236, 470
— — Artery Compression (Erlanger), 133
— — Effect of Light (Kestner), 133
— — Functional (Ives), 371
— — in Bat's Wing Vessels (Hill), 133
— — in Diabetes (Hitzenberger), 516

Blood Pressure in Horse (Fontaine), 133
— — in Infants (Seitz and Becker), 133
— — in Spinal Cat (Prewitt), 491; (Yates), 500
— — Self-Adjustment (Osborne), 193
— — Sphygmomanometer (Alexandre and Moulinier), 629; (Pachon and Fabre), 629
— Reaction (Evans), 497; (Chistoni), 497
— — after Acid Ingestion (Ege and Henriques), 382
— — after Hæmorrhage (Evans), 309
— — and Temperature (de Corral), 252, 309
— — and Urine (Bahlmann), 145
— — Class Exercises (Evans) 108
— — Electrode Error (Evans), 108
— — in Nephritis (MacNider), 196
— — Regulation (Evans), 424; (Haldane), 424
— Regeneration (Geiling and Green), 310; (Whipple and Robscheit), 425
— — etc. (Asher and Matsuno), 639
— Residual Nitrogen (Quagliariello), 38
— — — and Amino-Acids (Schweriner), 38
— Salts in Nephritis (Feigl), 39
— Sampling by Vasotomy (London and Kotschnew), 3
— Sedimentation (Kürten), 128; (Linzenmeier), 128; (Fåhræus), 186; (Schemensky), 186; (Gyorgy), 186; (Büscher), 366; (v. Oettingen), 366; (Various authors), 495; (Nadolny), 564; (Runnström), 624
— — after Thyroidectomy (Runnström and Schon), 495
— — and Agglutination (Starlinger), 254
— — in Pregnancy (Geppert), 254
— — in Tb (Westergren), 334
— Serum, Effect on Circulation (Freund), 571
— — Fœtal and Maternal (Fuhrmann), 496
— — Protein Products in (Bach and Sbarsky), 89
— Sodium (Doisy and Bell), 40
— Specific Gravity (Arndt), 252
— Sugar (Macleod), 268; (Guillaumin), 471
— — after Adrenaline (Boothby and Sandiford), 207; (Tatum), 520; (Brösamlen), 636
— — after Ether (Fujii), 580
— — after Ovariotomy (Hürzeler), 515
— — after Saline Infusions (Schenk), 514
— — and Adrenaline Glycosuria (Hildebrandt), 51
— — and Alkali Reserve (Hendrix and Crouter), 50
— — and Cancer (Bierry and others), 380
— — and Diabetes (Bierry and Rathery), 50; (Fitz and Bock), 636
— — and Food (Maclean and Wesselow), 50
— — and Furunculosis (Thalhimer), 49
— — and Glycogenolysis (Langfeldt), 268
— — and Glycosuria (Graham), 268
— — and Heat Regulation (Kuno) 514
— — and Liver (Mann and Magath), 207; (Bierry and Rathery), 322
— — and Parasympathic Drugs (Bornstein and Vogel), 580; (Hornemann), 591
— — and Phosphate (Elias and Weiss), 580
— — and Residual N (Rusznyák), 188
— — and Tumours (Rohdenburg), 380
— — Arrest of Glycolysis (Ambard), 52
— — Arterial and Venous (Ege and Henriques), 441
— — Curve in Children (Mertz and Rominger), 270
— — — in Hyperglycæmia (Labbé), 441; (Staub), 441
— — Distribution (Ege), 49
— — Effect of Exercise (Dürger), 52
— — Estimation (Kleiner), 6; (Ponder and Howie), 269; (Polonowski and Duhot), 403; (Fontès and Thivolle), 403; (Stepp), 404; (Reist), 404; (Tervaert), 404
Blood Sugar, Fish, Frog, Pigeon (Scott and Honeywell), 206
— — Glycolysis of (Clogne and Richaud), 269
— — in Anæsthesia (Ross and Davis), 51
— — in Nephritis (Kuga), 515
— — Method (Guy), 610
— — Micro-Method (Ernst and St. Weiss), 236
— — Nature (Cooper and Walker), 441
— — Normal (Cammidge and others), 514
— — of Infants (Guy), 580
— — Partition (Ege), 206
— — Pigeon (Honeywell), 636
— — State of (Onohara), 440
— — Total, in Diabetes (Fitz and Bock), 636
— — Variations (Stroase), 49
— Tissue Colloids (Kottmann), 89
— Transfusion (Karsner), 34; (Unger), 34; (Hoffmann and Habein), 128
— Types (Culpepper), 128
— Urea (Addis and Drury), 62
— — in Alimentary Intoxication (Wilmanns), 597
— — in Intestinal Obstruction (Louria), 425
— Uric Acid Estimation (Zaleski and Sachnovska), 130
— Venous, Oxygen Content (Barcroft and others), 572
— Viscosity and Composition (Rouzaud and Thiéry) 626, 627
— Volume (Erlanger), 252
— — and Gum-Glucose Infusions (Mattill and others), 144
— — in Anæmia (Denny), 128
— — in Pregnancy (Mahnert), 215, 385
— — Methods (Whipple and others), 366
— Water, and Dextrose (Barbour and Herrmann), 589
— White Cells after Infusions (Nürnberger), 424
Bloodvessels, Acids and Alkalies on (Heymann), 430; (Fleisch), 430
— Contraction of Surviving (Rothlin), 44
— Dilator Substances (Kondo), 526
— Effect of Drugs (Adler), 592
— — of H-ion (Atzler and Lehmann), 501
— — of Ions on (Schmidt), 314, 315
— — of Serum, etc. (Matsumura), 501
— Organic Cations on (Teschendorf), 386
— Permeability (Jacoby), 211; (Morawitz and Denecke), 314
— Pharmacology (Foà), 501; (Vernoni), 501
— Spontaneous Rhythm (McDowall), 314; (Wachholder), 501
Body Length (Gray and Root), 266
— Temperature. See Temperature: Heat Regulation
— — and Creatine (Takahata), 142
— — and Thermal Applications (Hill), 134
— Weight and Nutrition (Berliner), 141
Bombyx Eggs, Parthenogenesis (Lécaillon), 242
Bone, Circulation in (Foote), 617
— Formation, Aberrent (Asami), 357
— Growth of (Simon and Aron), 617
— Healing and Ca Phosphate (Behan), 245
— Heteroplastic Formation (Asami and Dock), 21
— Marrow, Giant Cells (Jordan), 179
— — in Chlorosis (Eichhorst), 244
— — Phagocytosis (Wislocki), 244
— Organic Matter (Radasch), 244
Bordet-Wassermann Reaction (Renoux), 90, 91
Bradycardia, Experimental (Fredericq and Descamps), 313
Brain and Liver Metabolism (Renauld-Capart), 305
— — Relations (Renauld-Capart), 122; (Crile), 456

Brain, Arteries of (Shellshear), 25
— Association System (v. Mayendorf), 123
— Autolysis and Memory (Bradley), 185
— Chemical Pathology (Pighini), 491
— Composition (Shimizu), 360
— Cortex and Stem (Mayendorf), 418
— in Dementia Præcox (Pighini), 183
— Lipoids and Fats (Magayania), 560
— Metabolism (Almeida), 503
— " Moral Centre " (Browning), 360
— of Bird (Groebbels), 183
— of Prodigy (Klose), 26
— Perfusion (Hayakawa and Kuno), 491
— Stem as Metabolism Regulator (Rogers and Wheat), 490
— Vascularity (Craigie), 360
— Zn and Cu in (Bodansky), 620
Branches, Orientation (Ricôme), 290
Bread, " Rope " in (Lloyd and others), 139
British Association Addresses (J. S. Gardiner, K. Pearson, J. Barcroft), 1
Bromide, Photographic Detection in Serum (Merke), 253
Bromine Detection (Oppenheimer), 333
— in Tissues (Damiens), 352
Bronchi, Excised, Drug Reactions (Macht and Ting), 592
Brownian Movement and Fibrils (Barratt), 293
Bryonia, Effect on Circulation (Gradinescu), 643
Bud Selection (Gardner), 102
Bulbospinal Path (Hirose), 249
Bundle of His, Glycogen in (Rojas), 554
Butter and Margarine Utilisation (Lundgren and others), 262
Butyl Fermentation (Neuberg and Arinstein), 533

Caffeine and Derivatives on Heart (Heathcote), 154
— and Heat Output (Bock and Bachholtz), 81
— as Anæsthetic (Alexander), 278
— Diuresis (Ellinger and others), 593
— Excretion (Friedberg), 389
— Sympathetic Paralysant (Fredericq and Descamps), 331
Calciolous Habit (Salisbury), 103
Calcium Absorption by Tissues (Freudenberg and György), 21
— and Drugs (Isener), 218
— and Magnesium Estimation (Kramer and Tisdall), 171
— and Mg in Serum (Kramer and Tisdall), 425
— and N in Plants (Parker and Truog), 340
— and P Excretion (Telfer), 432; (Zucker), 517
— and P_2O_5 in Blood (Jones and Nye), 426
— and Spasmophilia (Paassen), 488
— and Tetany (Collip), 23
— as Diuretic (Blum and others), 637
— Deficiency (Stheeman and Arntzenius), 157
— — in Food (Rubner), 262
— Equilibrium (Loew), 579
— Estimation (Kramer and Tisdall), 109, 171; (Tisdall and Kramer), 548; (Labbé and Toni), 549
— Fixation (György), 179
— — by Cartilage (Freudenberg and György), 357
— in Blood (Labbé and de Toni), 549
— — in Tetany (Tisdall and others), 456
— Ion and Stomach (Brinkman and v. Dam), 632
— Lack and Metabolism (Redotti), 636
— Magnesium Ratio for Plants (Pfeiffer and Rippel), 230
— Metabolism (Meysenbug, Hart and others), 510; (Blühdorn), 636
Calcium Metabolism and Diet (Robb), 141
— — and Drugs (Schiff and Peiper), 82
— — and Fats (Telfer), 154
— — and Fodder (Hart and others), 58
— — and Teeth (Rumsey), 66
— — in Swine (Forbes and others), 511
— of Blood (Clark), 253; (Richter-Quittner), 254; (Rösler), 255
— of Tissues (Freudenberg and György), 482
— Oxalate in Sputum (Mary), 392
— Potassium Balance in Heart (Loewi), 258
— — Law in Plants (Ehrenberg), 228
— Salts, Anticonvulsant (Pic and others), 390
Calomel, Purgative Action (Willigen), 152
Calorimeter Differential (Dixon and Ball), 14; (Gayda), 440
Calorimetry in Tb (McCann and Barr), 68
— See also Metabolism, Basal
Camphor as Heart Drug (Fröhlich and Grossmann), 312; (Wieland), 313
— *d*-, *l*-, and *i*- as Helmintic (Joachimoglu), 83
— Yield (Dunn), 397
Cancer, Blood P in (Gröbly), 283
— Experimental Tar (Murray and Woglom), 598
— O_2 Usage (Waterman and Dirken), 528
— Salts in (Waterman), 528
Caoutchouc, Solubility in (Bruni), 286
Capillaries after Hæmorrhage (Meek and Eyster), 259
— and Venules, Activity (Hooker), 45
— in Histamine Shock (Rich), 156
— in Raynaud's Disease (Halpert), 37
— Local Reactions (Krogh, Lennartz, Parrissius, Ebbecke), 571
— Permeability (Hanak), 371
— — and Salts (Smith and Mendel), 44
Capillary Circulation (Jürgensen), 193; (Hooker), 193; (Basler), 502
— Poisons and Acidosis (Wallace and Pollini), 155
— — Au and Pt (Gelpke), 314
— Pressure (Hill), 193, 314; (Hill and McQueen), 371
— — and Kidney (Hill and McQueen), 516
— — in Kidney (Hill), 259
— — in Man (Hill and McQueen), 45, 134
— Tone, Causation (Krogh and Harrop), 134
Capsella Constituents (Van Urk), 337
Carbohydrate Estimation in Food (Meyers and Croll), 318
— Formation in Plants (Baly and Heilbron), 603
— Metabolism (Sekita), 515
— — Intermediary (Stepp and others), 66
— Nitrogenous, from Protein (Schmiedeberg), 111
Carbohydrates, Plant (Blackman), 286
Carboligase (Neuberg and Hirsch), 160; (Neuberg and Liebermann), 478
Carbon Dioxide after Operations (Reimann and others), 152
— — and Hb (Buckmaster), 195
— — Effect on Soil (Noyes and Weghorst), 103
— — Estimation in Air (Freund), 7
— — Manure (Reinau), 100; (Bornemann and others), 230
— — on Heart (Burridge), 192
— — Transport (Collip), 196
— Monoxide, Effects (Kochmann), 48
— — Elimination (Haggard), 48
— — from Urea (Hurtley), 240
— — Hæmoglobin Affinity (Prince), 48
— — See also Carboxyhæmoglobin
— — in Blood (Stockis), 255; (Kruse), 350; (Nicloux), 425
— — in Plants (Langdon and Gailey), 100

Carbon Monoxide on Heart (Haggard), 431
— — Poisoning (Haggard and Henderson), 526
— — — and Blood Alkali (Haggard and Henderson), 431
Carbonate, Effect on Duodenum (Hammett), 198
— Ion, Effect on H Electrode (Evans), 108
Carbonates, Estimation (Robinson), 338
Carbonic Acid. See Carbon Dioxide
Carboxyhæmoglobin to Met. Hb (Kruse), 187
— Test (Stockis), 255
Carcinoma. See Cancer
Cardiac Cycle (Wiggers), 426
— Dyspnœa, Respiration in (Barr and Peters), 48
— Reflexes (Carlson and Luckhardt), 122
Cardio-Inhibitory Centre (Becht), 369
Cardio-Muscular Indices (Dawson and Kupperman), 169
Cardio-Respiratory Mechanism (Pearce), 136
Carminatives, Action on Intestine (Plant), 83
Carnosine Estimation (Clifford), 406
Carotene, Oxidation of (Verne), 15
Carrageen (Hass and Hill), 158; (Haas), 458
Cartilage after S Injection (Bisch and Heubner), 482
— Sap Canals (Schultze), 179
Casein, Action of, Parenteral (Riedel), 11
— an Ampholyte (Loeb), 111
— and Electrolytes (Loeb), 611
— Solution (Mellanby), 111
— Solutions, Behaviour (Loeb), 174
— Viscosity (Zoller), 296
Caseinogen an Acid (Mellanby), 111
— Hydrolysis (Onslow), 407
Castration of Guinea-pig (Gley and Pézard), 587
— Partial (Lipschutz and others), 329
Cat, Tortoiseshell, Genetics (Little), 641
Catalase and Cyanide (Welker and Bollman), 218
— and Oxidation (Burge and Leichsenring), 205, 410; (Morgulis), 410
— Blood, in Disease (Strauss and Rammelt), 478
— Dynamics (Morgulis), 410
— in Fish (Stockstad), 112
— in Life Cycle (Burge), 235
— of Insects (Bodine), 410
— of Muscle and Liver (Burnett), 246
— Temperature Coefficient (Stoland and Walling), 175
Cataphoresis of Drugs (Inchley), 325
— of Organisms (Szent-Györgyi), 219
Cataract and Ultraviolet (Hoeve), 124
Caterpillars, Blue-Green (Gerould), 553
Cell Division and Chromosomes (Sakamura), 222
— — and Osmosis (Dragoiu and Vlès), 301
— — Physiology (Haberlandt), 222
— — Plant (Haberlandt), 284
— Respiration (Warburg), 412
Cellobiose (Hawarth and Hirst), 8; (Karrer and Widmer), 296
Cells, Artificial Osmotic (Kolkowitz), 158
— Charge on (Heesch), 481
— Renewal of (Wegelin), 355
Cellulose (Karrer and Widmer), 238; (Hess, Messner and Freudenberg), 337; (Harding), 337; (Salkowski), 531
— Chemistry (Minor, Hibbert), 600
— Constitution (Hess), 8
— Fermentation in Ox (Krogh and Schmidt-Jensen), 66
— — in Ruminants (Klein), 316
— of Spruce (Klason) 600
— Solubility in Salts (Herzog and Beck), 8
— Staining (Maestrini), 536
Central Nervous System, Structure (Groebbels), 123
Central Nervous System, Symptoms in (Walshe), 609
Centre of Gravity (Dawson and others), 169
Cephalin (Fenger), 550
Cereal Seeds, Heated (Atanasoff and Johnson), 544
Cereals, Humidity (Chopin), 285
Cerebellum Functions (Harris), 362
— Localisation (Hesser and Troell), 560
Cerebral Cortex, Chronaxie (Tedeschi), 183
— Localisation (Demoor), 560
Cerebro-Spinal Fluid (Fleischmann), 127
— — Absorption (Wislocki and Putnam), 420
— — Acetone, Cholesterol, Pigment (Koopman and others), 252
— — Alcohol in (Lenoble and others), 128; (Ducamp and others), 308; (Carrieu and others), 493
— — and Drugs (Becht and Gunnar), 365
— — and Pituitary (Fleischmann), 308
— — Chemistry of (Various papers), 564
— — Circulation (Lafora and Such), 32
— — Colloids (Ellinger), 624
— — Congo-Rubin Test (Lüers), 32
— — Glucose (Haan and Creveld), 623
— — Hæmolysin (Haoi), 493
— — Iodine in (Osborne), 308
— — Origin, etc. (Stern and others), 564
— — Pituitary-like Substance (Dixon and Cow), 31
— — Pressure (Barré and Schrapf), 365; (Weed and Hughson), 623
— — — after Adrenaline (Becht), 185
— — Protein (Ayer and Foster), 420
— — — Test (Noguchi), 127
— — Reaction (Shearer and Parsons), 31
Cerebrum and Arterial Pressure (Rogers), 183
— and Learning (Lashley), 622
— and Sympathetic (Rogers), 183
— and Thalamus, Relation to B.P. (Rogers), 25
— Metabolism and Liver (Renauld-Capart), 24
— Origin (Herrick), 24
Cetacea (Morimoto and others), 547
Charcoal, Animal, Adsorption of Chlorides (Hartleben), 173
— Oxidation by (Warburg and Negelein), 175
— Wood, Adsorption by (Herbst), 173
Chelidonin (Hanzlik), 592
— Pharmacology (Hanzlik), 82
Chemical Sense of *Nereis* (Gross), 115
Chemoreceptors in Butterflies (Minnich), 177
Chemotaxis and Osmosis (Maltaner and Hoppe), 19
— of Leucocytes (Maltaner and Hoppe), 35
Chemotherapy, Recent Tendencies (Dale), 151
Chemotropism in Flies (Speyer), 615
Chenopodium Oil Effects (Salant and Battle), 388
Chimpanzee, Infant (v. Allesch), 547
— Psychology of (Köhler), 622
Chitosan Compounds (Brunswick), 394
Chitose, Individuality of (Hermann), 173
Chloral and Chloralose on Nerve (Legendre), 305
Chlor-Carbonic Esters, Toxicity (Mayer and others), 85
Chloride, Estimation in Urine (Atkinson), 5
— Metabolism (Boenheim), 512
— Micro-Method (Rusznyák), 171
— of Blood and Milk (Denis and Sisson), 318
— — and Reaction (McLean and others), 33
Chlorides and Tissue Fluids (Mestrezat and Ledert), 352
Chlorine Antiseptics (Barbour and Hjort), 594
— Estimation in Tissues (Bell and others), 109
— Plant (Jung), 223
Chloroform After-Effects (Teschendorf), 526
— and Adrenalin (Heinekamp), 72
— Dose (Ide), 527

Chloroleukæmia, Marrow Cells in (Eichhorst), 244
Chloroma Pigments (Kossel and Giese), 240
Chlorophyll and Pyrrole (Oddo and Pollacci), 222
— Bleaching by Light (Wurmser), 289
— Crystals (Kolkwitz), 223
— Fluorescence (Stern), 159, 458
— in Autumn Leaves (Kolkwitz), 160; (Meisnser), 160
Chlorosis in Pines (Ludwig), 228
— Lupins (Merkenschlager), 543
— Wheat, and CH (McCall and Haag), 605
Chlorpicrin Toxicity (Mayer and others), 85
Cholecystogastrostomy (Heyd), 434
Cholesterol (Windaus and v. Staden), 351
— and Allies (Gardner and Williams), 405
— Blood (Knudson), 39; (Richter-Quittner), 189; (Abelous and Soula), 316; (Rouzand and Thiéry), 627
— — in Anæmia, etc. (Kipp), 39
— Cycle (Chauffard and others), 267
— Derivatives (Windaus and Lüders), 475; (Windaus), 612
— Dibromide (Lifschütz), 296
— Estimation (Feigl), 5
— in Cerebro-Spinal Fluid (Levinson and others), 252
— in Fat (Gardner and Fox), 406
— Metabolism (Wacker and Beck), 378
— Origin and Fate (Gardner and Fox), 611
— Reactions of Terpenes (Galavielle and others), 238
Choline and Creatine (Shanks), 321
— and Peristalsis (Kühlewein), 575
— as Intestinal Hormone (Le Heux), 505
— Derivatives (Fourneau and Gonzalez), 613
— Esters on Intestine (Le Heux), 505
Choloidanic Acid (Wieland), 9
Chondriome, Plant (Guilliermond), 530
Chondroitin-Sulphuric Acid (Schmiedeberg), 111
Choroid Plexus in Disease (Morokawa), 421
— — Permeability (Barbé), 32, 185
— — Structure (Watrin), 421
Chromatic Aberration (Polack), 363
Chromatin in Crossings (Hertwig), 150
Chromatophores, Innervation in Fish (Schaefer), 236
Chromosomes, Heteromorphic Homologous (Carothers) 301
— in Oogenesis (Gelei), 616; (Seiler), 616
— Rotifer (Shull), 410
— Structure (Lee), 18
— X (Mavor), 479
Chronaxie and Poisons (Bourguignon), 642
— and Repercussion (Bourguignon), 488
— Nerve and Muscle (Banu and others), 558
— See also under Individual Tissues
Chrysalis Oil (Kawase and others), 405
Ciliary Body, Staining (Seidel), 419
— Ganglion, Dissection (Cooper and Groot), 402
— — for Class Work (McGuigan), 3
— Movement (Inchley), 108; (Gray), 355
Ciliated Cells, Amitosis (Helvestine), 552
Cimex Reproduction (Cragg), 411
Cinchoninic Acid Derivatives (Myers and Killian), 590
Circulation in Anæmia (Morawitz and Denecke), 570
— in Anoxæmia (Schneider and Truesdell), 370; (Gilbert and Greene), 372
— in Arm (Laubry and others), 502
— Rate by Blood O_2 (Barcroft and others), 572
— Stasis in Man (Scott), 193
— Time, Cyanide Method (Loevenhart and Schlomovitz), 370
Circulation Time in Organs (Stewart), 629
Citric Acid Estimation (Amberg and Maver), 209; (McClure), 209
Citrus Fruit Spotting (Fawcett), 649
— Leaves (Kelley and Cummins), 394
Climate and Work (Breinl), 349
Coagulation, Perivisceral Fluid (Kindred), 615
Coagulins, Tissue (Mills), 186
Cocaine Action on Brain (Macht and Bloom), 154
— Adsorption by Brain (Eerland and v. Leeuwen), 593
— and Bloodvessels (Abe), 218
— Antidotes (Hofvendahl), 333
— on Cerebrum (Macht and Bloom), 389
— on Heart (Kochmann), 500
on Rats (Macht and Bloom), 331
Codein Derivatives, Action (Biberfeld), 85
Cod-Liver Oil (Zilva and Drummond), 508
Cœlomic Corpuscles (Romieu), 552
— Fluid of Molluscs (Collip), 16
Coferments of Amylase (Biedermann), 13
Coffee as Anæsthetic (Alexander), 278
Cold on Cacti (Uphof), 397
— on Plants (Colville, Blish), 463
Collier's Work, Metabolism (Waller and de Decker), 204
Collodion Membranes (Eggerth), 548
— Sacs for Bacteriology (Gates), 109
— — Preparation (Gates), 599
Colloidal Electrolytes (McBain), 110
Colloids and Crystalloid Drugs (v. Leeuwen and Zeijdner), 280
— and Drugs (Leeuwen), 151
— and Salts in Growths (Scala), 173
— Swelling of (MacDougall), 94
Colorimetric Methods (Takata), 172
Colostrum (Porcher and Panisset), 61
Colour Blind Margin (Ebbecke), 124
— Blindness and Contrast (Guttman), 307
— — Red-Green (Hess), 124
— Comparator, Double-Wedge (Barnett), 108
—Filters, Gelatin (Pringsheim), 159
— of *Oryzias* (Ishihara), 115
— Vision (Koellner), 419; (Swindle), 620
— — Quantum Theory (Joly), 362
— — Red Fatigue (Edridge-Green), 362
Coloured Thinking (Harris), 31; (Perrycoste), 127
Colpidium Cultures (Peters), 298
Combination Tone Theory (Broemser), 28
Complement and Amboceptor (Mandelbaum), 156
— Fixation (Kahn), 529
— Thermolability (Coulter), 457
Conductivity, Electrical, and Hormones (Crile), 70
Congo Red and Protective Colloids (Bousmann), 496
Conjugaceæ (Wildeman), 229
Conjugation in *Spathidium* (Woodruff and Spencer), 479
Connective Tissue, Embryonic (Baitsell), 20
— — Fibres, Ag Method (Perdrau), 21
Convallaria Standardisation (Zondek), 525
Cooking, Effect of (Waterman and Johns), 199; (O'Reilly and McCabe), 199
Copper, Action of, on Moulds (Villedieu), 288
— and Crops (Forbes), 396
— in Tissues (White), 481
Corn and Weather (Wallace), 342; (Warren Smith), 343
Cornea, Permeability (Goldschmidt), 83
— Transplantation (Ebeling and Carrel), 561
Coronary Circulation (de Barenne), 370, 428
Corozo Nut as Feed (Beltrami), 58
Corpus Callosum Functions (Lafora and Prados), 25

Corpus Luteum and Gestation (Nåslund), 150
— — Genesis (Hirose), 77, 523
— — Hormone (Wintz), 149
— — Menstruation and Ovulation (Tschirdewahn), 78
— Striatum (Vogt), 25; (Lhermitte), 490
Corpuscle-Plasma Volume Estimation (Hamburger), 402
Correlation and Causation (Wright), 530
Cotton Deterioration (Fleming and Thaysen), 459
— Root Bark, Pharmacology (Eckler), 82
Cottonseed Meal as Hog Feed (Burns), 139
Creatine and Body Temperature (Takakata), 142
— and Choline (Shanks), 321
— and Creatinine of Muscle (Hammett), 557
— Conversion to Creatinine (Hahn and Barkan), 5
— from Meat Extract (Steudel), 8
— in Blood (Allen and Benedict), 188
Creatinine and Parathyroid (Hammett), 583
— Estimation (Blau), 550
— Excretion (Schulz), 145
— — and C.N.S. (Weinberg), 324
— in Cryptobranchus (Reuter), 16
— Metabolism (Bürger), 205
Creatinuria (Gross and Steenbock), 205, 378
— Diet and Sex Effects (Stearns and Lewis), 267
Cresol Estimation (Chapin), 403
Cresols as Disinfectants (Ditthorn), 163
Crop Yield (Meyer), 99; (Mitscherlich), 99; (Baule), 99; (Hartwell and Damon), 163; (Hartwell and others), 163; (Mitscherlich), 163; (Pfeiffer and Rippel), 163; (Hiltner and Lang), 163; (Harris), 397; (McClatchie and others), 398; (Schultz, Stewart, Taylor), 461
— — and Illumination (Rivera), 230
— — of Corn (Carr and Hoffmann), 99
Crops and Moisture (Harris and Maughan), 230
Crystallisation of Large Molecules (Herzog and Becker), 110
Curari, Action (Guglielmetti and Pacella), 358; (Edström), 414
— — on Frog (Houssay), 248; (Guglielmetti and Pacella), 248
— Substitute (Ackermann), 3
Current of Action and Drugs (Vorschütz), 524
Currents, Resting (Viale), 617
Cyanic Acid and Urea, Relations (Fosse), 240
Cyanides and Catalase (Welker and Bollman,) 592
Cyanogenesis in Sudan (Menaol and Dowell), 532
Cyanophyceæ, Cytoplasm of (Baumgärtel), 228
Cyclic Compounds, Fate of (Schempp), 635
Cycloloma atriplicifolium (Pratt), 336
Cystein-Glutamic Dipeptide (Hopkins), 301
Cysteïne Metabolism (Kapfhammer), 612
Cystine and Growth (Johns and Finks), 262
— Oxidation (Lewis and Root), 205
Cytisine Characters (Führer and Mertens), 219
Cytology, Nomenclature (Cowdry), 553

Daphnia for Class Experiments (van Herwerden), 16
Datura Disease (Blakeslee), 291
Decalcifying Fixative (Jenkins), 172
Decidua Structure (Fujimura), 585
Defence Enzymes against Polysaccharides (Abderhalden), 352
— Substances, Plant (Patschovsky), 158
Denitrification of Sewage (Cooper), 460
Desaminoproteins (Herzig and Lieb), 612
Desert Plants (Sabnis), 94, 336, 530, 644
Desoxybilianic Acid, Derivative of (Wieland and Kulenkampff), 9
Desoxycholic Acid (Wieland and Schulenburg), 240
Detoxification by Adsorption (Wieland), 313
Developmental Defects (Various authors), 486
Dextrose. See Glucose
Diabetes (Graham), 268; (Ambard and Lux), 323
— Acidosis and Creatinuria (Lauritzen), 207
— — in (Calvert and others), 143
— Alkali Administration (Cary), 323
— — Reserve and Sugar (Hendrix and Crouter), 50
— and Fat Metabolism (Blau and Nicholson), 51
— and Kidney (Schirokauer), 52
— and Menstruation (Rosenbloom), 380
— and Pancreas (Paulesco), 580
— and Pancreatic Extract (Paulesco), 442
— and Suprarenal Irradiation (Beumer), 443
— and War Diet (v. Noorden), 51
— Blood Pressure in (Rosenbloom), 443
— — Sugar. See Blood Sugar
— Cause of (Schmiedeberg), 443
— Cl and Œdema (Wilder and Beeler), 207
— Conditions (Allen), 142
— Diagnosis of Latent (Sherrill), 637
— Diet and Ketosis (Ladd and Palmer), 143
— — in (Woodyatt), 443
— Effect of Cold, Age and Pregnancy (Allen), 51
— — of Exercise (Bürger), 52
— Experimental (Allen), 269
— Fat Diet in (Newburgh and Marsh), 51, 380
— Grades of (Chabanier and others), 322
— Insipidus and Pituitary (Marañon), 274; (Several authors), 383
— — Infantile (Narigawa), 73
— — Metabolism (Goeke), 73
— Pancreatic and Glycogen (Paulesco), 51
— Pituitary in (Kraus), 143
— Urinary Aldehydes in (Steep and Lange), 66
— Urine in (Claudius), 323
Diabetic Muscle Metabolism (Parnas), 485
Diaphragm Oscillations (Nice and Neill), 415, 416
— Tonus (Nice and Neill), 181
Diaphragma Urogenitale (Peterfi), 523
Diastase. See Amylase.
Diazo-Reaction (Hermanns), 518
Dichlorethyl Sulphide (Marshall and William), 85
Dichlornitromethane Toxicity (Mayer and others), 85
Didinium, Amicronucleate Race (Patten), 298
Dielectric Constants (Keller), 172
Diet, Adequate (Mitchell and Mendell), 623
— and Energy Expenditure (Orr and Kinloch), 141
— and Growth (Hume), 264
— — in Japanese (Yano), 141
— and Health (van Leersum), 632
— and Suprarenal (Kellaway), 57
— and Teeth (Wells), 319
— for Gastric Ulcer (Coleman), 155
— for Work Horses (Carroll), 262
— 90 p.c. Protein (Osborne and Mendel), 318
— of Children (McCarrison), 57
— of Working Class (Tully), 318
— Yeast and Milk (Hawk and others), 319
Diffusion and Osmosis (Weatherwax), 94
— of Foodstuffs and Enzymes (Neill), 549
Digestive Hæmoclasis (Santenoise and Tinel), 591
Digitalis (Joachimoglu), 593
— and Colour Sense (Bohnenberger), 27
— and Contraction of Heart (Schönleber), 81
— Effect on C.N.S. (Macht and Bloom), 623
— — on Pacemaker (Schlomovitz), 628
— on Circulation (Harris), 279
— Pharmacology (Scott), 387; (Dooley), 387
— Therapy (Luten), 81

Digitalis Tincture (Weiss and Hatcher), 154
Digitoxin, Chemistry and Pharmacology (Cloetta), 81
Dioxyphenyl Alanine, *dl*-3:4 (Hirai), 224
Disinfection by Cresols (Ditthorn), 163
— by Ions (Eisenberg), 163
— by Phenol (Smith), 399
— Theory of (Traube and Somogyi), 453
Diuresis and Elimination Rate (Carr), 581
— and Ions (Blum), 593
— and Phosphate Excretion (Bock and Iversen), 144
— and Piqûre (Hug), 418
— and Water Content (Oehme), 323
— — Regulation (Priestley), 581
— Caffeine (Ellinger and others), 593
— on Glucose and Gum Injections (Cori), 269
Diuretics (Cushny and Lambie), 453
Divarinol in Lichen (Sonn), 337
Diving, Physiology of (Thooris), 349
Donnan Equilibrium (Loeb), 295
— — and Proteins (Loeb), 404, 472
Drop Recorder (Ellinger), 237
Drought at Kew (Anon.), 649
Drug Therapy (Rowntree), 523
Drugs, Absorption by Galvanism (Inchley), 325, 642
— — Local (Leeuwen and Eerland), 86
— and Cell Products (Freund and Gottlieb), 218
— and Colloids (Leeuwen and Szent-Györgyi), 643
— and Ionic Balance (Zondek), 593
— Effects and Mode of Administration (Kolmer), 591
— — of Colloids on (Leeuwen), 151
— Electric Absorption (Inchley), 325, 642
— Heart, and Ca and K ions (Zondek), 87
— Muscle and Nerve, Localisation (Jacoby), 86
— Sensitiveness to (Leeuwen and others), 86
— Synergism (Führer), 85
Dunaliella, Adaptation (Labbé), 241
Duodenal Contents (McClure and others), 575
— Enzymes (McClure and others), 373
Duodenum, $MgSO_4$ Lavage (Crohn and others), 373
— Regurgitation from (Jarno and Vándorfy), 261
Dyspnœa, Cardiac, Blood CO_2 in (Peters and others), 135
Dystrophia Adiposogenitalis (Ebaugh and Hoskins), 149

Ear Vesicle Migration (Streeter), 250
— Vesicles, Orientation (Ogana), 363
Earthworm, Composition of Dried (Murayama and Aoyama), 299
Ecology (Kenoyer), 649; (Vohl), 650
— of Deccan (Burns and Chakradev), 343
— of Gangetic Plain (Dudgeon), 102
— of Moors (Montfort), 231
— of Natal (Bews), 343
— of *Oxalis* (Borzi), 232
Edestin as Substrate (Brewster), 171
Eel Extract (Yoshimura), 349
Egg, *Arbacia*, Tonicity Effects (Lillie and Baskerville), 479
— Formation (Giersberg), 587
— Frog's (Terroine and Barthélémy), 586, 587; (Frémiet and Streel), 587; (Fauré-Fremiet and Streel), 641
— *Sabellaria*, Chemistry (Fauré-Fremiet), 615
— Starfish (Chambers), 479
Eggs, Chemistry of (Tomita), 474
— Glucose (Hepburn and St. John), 200
— in Peritoneal Cavity (Weber), 385
Electric Charge in Cells (Heesch), 481
Electric Organ, K in (Woerdeman), 555
— Potential of Body (Potter), 547
— Resistance of Tissues (Philippson), 116, 609
Electricity and Plants (Stoppel), 233
Electrocardiogram (Hoffmann), 41; (Fredericq), 370
— and Poisons (Schott), 42
— in Anoxæmia (Greene and Gilbert), 427, 192
— in Short Systole (Mandelbaum), 427
— Interpretation (Fredericq), 498
— of Elephant (Forbes), 256
— of Fœtus (Nörr), 255
— of Ox (Nörr), 256
— S-T Interval (Buchanan), 570
— Sequence in (de Meyer), 570
Electrocution (D'Halluin), 455
Electrodes, E.M.F. on Ag (Brown and Hill), 108
Electrolytes and Gels (Adair), 7
— on Serum Albumin (Szent-Györgyi), 12
Electronic Tube. See Thermionic Valve
Electrophysiology (Viale), 617
Embryo, Human (Streeter), 586; (Mall and Meyer), 641
— Tissue, Reserve Energy (Burrows), 244
— Vital Staining (Wislocki), 586
Embryology, Pioneers of (Jackson), 108
Embryonic Development (Anders), 304
Emetine on Heart (Arrillaga and Guglielmetti), 454
— Pharmacology (Niccolini), 331
Emmenagogue Oils (Gunn), 155
Emotions Theory and Adrenals (Kieley), 31
Emotive Response (Waller), 185
Empiricism, Rational (Rudolf), 642
Emulsin, Existence of (Nordefeldt), 352
— Malt (van Laer), 286
— Precipitation (Bridel and Arnold), 13
Enamel Organ (Jordan), 413
Encephalitis, Lethargic, Histology (da Fano), 157
Endocrine and Evolution (Bolk), 445
— and Heart Rate (Cannon and Rapport), 639
— and Mikulicz Syndrome (Taschenberg), 213
— and Pancreas (Tokumitsu), 71
— and Tumours (Hammett), 213
— Epilepsy (Van d. Berg), 448
— in Metabolism (Biedl), 582
— in Pelvic Surgery (Rosser), 582
— Organs (Pottenger), 271; (Several authors), 383
— — and Electrical Conductivity (Crile), 70
— — and Pregnancy (Mahnert), 75
— — and Testis (Nakamura), 75
— — Classification (Pottenger), 271
Endocrinology and C.N.S. (Löffler), 581
— Current Trends (Hoskins), 581; (Anon.), 581
Entero-Hepatitis and Ipecac. (Wegeforth), 280
Enterolith (Raper), 90, 222
Entoptic Phenomena (Ebbecke), 124
Enzyme Action (Armstrong), 407
— — Heat Production (Inouye), 206
— — Mechanism (Northrop), 551
— Chemistry (Bokorny), 225
— Proteolytic, of Urine (Hedin), 145
Enzymes (Jacoby), 647
— and Ions (Biedermann), 224
— and Pressure (Frankel and Meldolesi), 175
— Assimilatory (Staub), 322
— Chemistry of (Bokorny), 352
— Defensive (Hirsch and Löwe), 225
— — and Carbohydrates (Herzfeld and Klinger), 175
— Diastatic, and P_H (Hahn), 225, 226
— Elution (Willstätter and Kuhn), 478

Enzymes, General (Mühlmann), 477
— Latency Time (Baas-Becking), 297
— Nature (Herzog), 112
— of Algæ (Sjöberg), 224
— of *B. coli* (Grey and Young), 286
— of *Penicillium* (Euler), 339
— of Plants (Maestrini), 536
— of Turkey Fat (Hepburn), 179
— Oxidising (Battelli and Stern), 535
— P_H and Temperature (Compton), 96
— Poisons on (Rona and others), 391
— Protective (Grönberg), 551
— Ptyalin and HCl (Maestrini), 175
— Yeast (Fodor), 97
— See also under Individual Enzymes
Epididymis, Secretion (Benoit), 640
Epilepsy, Experimental (Amantea), 361
— Endocrine (Van d. Berg), 448
Equilibration and Nystagmus (Brabant), 307
Erepsin, Peptidolytic Action (Clementi), 54
Ergot as Styptic (Maeda), 453
Esters as Ampholytes (Euler and Svanberg), 350
Ethyl Chloride Anæsthesia (Guedel), 451
— Galactoside (Bridel), 647
— Hydrocuprein (Kolmer), 591
Euglenaceæ, New Sp. (Gickelhorn), 224
Eukupine and Vuzine (Bylsma), 81
Euphylin as Styptic (Meissner), 453
Excretion, Plant (Wolk), 222
Exercise and Body Temperature (Rancken), 68
— and Metabolism (Rancken), 578
— Circulation in (Bruns), 427
— Effect on Blood-Sugar, etc. (Bürger), 52
— Heart Acceleration (Glaus), 41
Exodic Excitation and Inhibition (Tashiro), 217
Experimentation (Arthus), 469
Extractives of Arthropod (Ackermann), 479
— of *Cryptobranchus* (Reuter), 16
Eye Movement Centres (Gertz), 306
— Photo-Electric Currents (Sheard), 27
— — Response (Beuchelt), 307
Eyes and Labyrinth Reflexes (de Kleijn), 29

Fæces, Action on Nucleic Acid (Rother), 267
— Blood in (Eck, 369; (Snapper and Dalmeyer), 456
— Fat in (Howe), 318
— Na, K, Ca, Mg in (Tisdall and Kramer), 548
— Occult Blood (Adler), 190
— Trypsin in (Krieger), 54
— Unsaponifiable Matter (Gardner), 296
Fascia Dentata, Cells (Such), 26
Fat as Antigen (Beumer), 529
— Diet Poor in (Osborne and Mendel), 56
— Digestion and Pancreas (Labbé), 137
— Effect on Metamorphosis (McCarrison), 579
— Food and Ca and P Metabolism (Telfer), 154
— Free Diet (Drummond and Coward), 509
— from Carbohydrate (Baumgardt), 66; (Witzemann), 267
— from Protein (Lusk), 66
— Goose (Amberger and Bromig), 550
— Horse (Heiduschka and Steinruck), 550
— Metabolism of (Waringer), 550
— Mutton-Bird (Carter), 550
— of Gonads of *Rhizostoma* (Haurowitz), 15
— of Micro-Organisms (Lindner), 224
— of Wool (Lifschütz), 475
— Rabbit's (Dowell), 579
— Solubilities in Alcohols (Vandevelde), 173
— Staining (Smith), 355; (Boeminghaus), 617
— Utilisation of Butter, etc. (Lundgren and others), 262
Fatigue and Acid (Philippson and Hannevart), 22
— and Efficiency in Iron Industry (Vernon), 1
— and Error (Baumberger), 623
— and Practice (Gellhorn), 364
— and Precision (Apajalahti and Panelius), 492
— and Retention (Morgan), 30
— Attitudes (Azzi), 487
— Industrial (Goldmark and Hopkins), 1
— Muscular and Lipoid Solvents (Baldwin), 180
— Simulation of (Wells and others), 563
Fatty Acids, unsaturated, in Fish Oils (Tsujimoto), 9
Fechner's Law (Peddie), 306
Feed for Cattle (Ellet and Holdaway), 57; (Beltrami), 58
Feeding, Carbohydrate, for Infants (Bloch), 139
— of Mussels (Allen), 114
— of Nereis (Gross), 115
Fermentation (Costantino), 536
— Acetaldehyde in (Neuberg and Cohen), 646
— Acetic and Lactic (Fred and Peterson), 601
— Alcoholic, Spontaneous (Satowa), 226
— and Purines (Neuberg and others), 534
— Catalysors (Neuberg and others), 646
— Co-Enzyme (Tholin), 536
— Effect of Quinine (Schulz), 81
— Physiology of (Harden and Henley), 287
— Poisoning of (Plagge), 533
— Pyruvic Acid in (v. Grab), 613, 646; (Kerb and Zeckendorf), 646
— Three Modes (Neuberg), 96
— without Yeast (Baur and Herzfeld), 297; (Bau), 646
Ferrous Sulphate, Action (Sabbatani), 454
Fertilisation, Effect of Cu (Lillie), 614
— Heterogeneous (Labbé), 641
— Mechanism (Lillie), 17
— *Ophrys* (Godfrey), 542
Fertilisers (Lipman and Linhart), 601; (MacTaggart), 601; (Various authors), 602
— Borax in (Blair and Brown), 602
— Nitrogenous (Lipman and Blair), 291; (Thorne), 291
— on Blueberries (Beckwith), 340
— Sulphur (Matenaers), 602
— See also Manures
Fever, Metabolism in (Du Bois), 438
Fibre, Digestion of Crude (Thomann), 200
— Plants (Brown), 94
Fibres, Visibility of Fine (Einthoven), 561
Fibrillation, Auricular. See Auricular Fibrillation
— Ventricular, by Warming (Schlomovitz), 257
— — in Frog (de Boer), 257
Fibrinogen Gelation with NaOH (Barratt), 254
— Method of Preparation (McLean), 12
— Precipitation by $CHCl_3$ (Nolf), 187
Fibroblasts, Age and Growth (Carrel and Ebeling), 617
— Growth and P_H (Fischer), 554
— — in Vitro (Carrel and Ebeling), 481
Finger Print Inheritance (Elderton), 547
Fish, Colour Changes (Schaefer), 236
— Composition (Dill), 507
— Developing (Ellis), 555
— Migration (Chidester), 294
— Oils, Unsaturated Acids in (Tsujimoto), 9
— Poisons (Evans), 596
Flagellates as Oxygen Indicators (Fox), 298
Flight of Birds (v. Uexküll), 121
Flocculation Optima (Labes), 110
Flow Recorder (Ellinger), 237
Flower and Fruit (Various), 397

Flower Opening (Christy), 542
Flowering and Light (Garner and Allard), 649
Flowers, Colour and Sex (Blaringhem), 102
Fluorescent Action (Rebello), 227
— and Photodynamic Action on Cells (Jodlbauer and Haffner), 354
Fluorides, Effects (Sollmann and others), 281
Fodder, Bamboo as (Clouston and Plymen), 57
— Dry and Fresh (Hart and others), 58
Fœtus, Movements of (Minkowski), 182
Food, Accessory Factors (Aron and Gralka), 201.
— See Vitamins
— Ash Analysis (Tillmans and Bohrmann), 262
— Bracken Rhizomes (Hendrick), 200
— Chicken (Phillips and others), 435
— Cotton-Seed (Macy and Alter), 201
— Effect on Blood N, etc. (Corinaldesi), 267
— Energy Content of (Benedict), 262
— Factors and Oxygen Usage (Freudenberg and György), 58
— Famine (Pathak), 200
— for Chicks (Buckner and others), 58
— from Sea (Grabham), 633
— Mineral Requirements (Peters), 375
— Putrid (Savage), 390
— Ration, Digestibility (Honcamp and Koch), 139
Foreign State, the (Abderhalden), 107
Forest Ecology (Kenoyer), 649
Formaldehyde in Body (Salkowski), 173
Formic Acid in Metabolism (Stepp and Zumbusch), 66
— — Intoxication (Sollmann), 155
— — Metabolism (Slosse), 68
Fragilitas Ossium, Galvanic Response (Bolten), 283
Free-Martin Gonads (Willier), 213
French Science and Medicine (Lusk), 1
Frosting of Plants (Young), 233
Frozen Fruit (Dehn and Taylor), 94
Fructose as Food (Daniel), 434
Fruit Juices (Various), 510-11
— Pollination (Anon.), 342; (Hooper), 342
— Storage (Esam), 336; (Various), 463, 464
— Sugar (Arreguine), 336
— Various (Several Papers), 397
Fucus, Composition (Lapicque and Emerique), 645
Fumed Oak (Tinkler), 458
Fungi as Food (Völtz and others), 263
— Chemistry (Zellner), 532
— Cytology (Guilliermond), 94
— Grown in Cis- and Trans- Forms (Verkade and Söhngen), 162
— — in Sucrose Solution (Bezssonoff), 162
— Poisoning by (Fahrig), 86
— Poisonous (Bruynoghe), 596
— Spores (Collett), 648; (Buller), 648
— Symbiotic (Brues and Glaser), 543
— Thermophile (Noack), 229
Fur, Change to Black by Cold (Schultz), 3

Galactonic Lactone (Levene and Meyer), 238
Galactose, *d*-, Fermentation (Tomita), 534
— from Lactose (Clark), 351
Gall Bladder, Bile of (Grego) 137; (Toida), 138
— — Concentration by (Rous and McMaster), 56
— — Functions (Rous and McMaster), 374
— — Hydrops (Toida), 138
Galvanic Response of Skin (Ebbecke), 482
Ganglion, Cervical, Cell Growth (Ping), 489
— Mesenteric (Vernet and Mones), 489
Gas Analysis (Bailey, Newcomer), 403
— — Apparatus (Dirken), 470
— — Method of (Trendelenburg), 5
Gas Analysis, Micro-Method (Jordan and Schwarz), 108
— Meter (Newcomer), 403
— Poisoning, Esters (Wachtel), 84
— Volumeter (Harris), 170
Gaseous Exchange in Rowing (Dirken), 372
— Metabolism. See Basal Metabolism
Gasoline. See Petrol
Gastric Analyses (Rehfuss and Hawk) 136; (Ryffel), 137
— Contents Analysis (Cole and Adie), 54
— — Heterogeneous (Wheelon) 632
— Digestion and Onions (Wilbrand), 137
— Glands, Distribution of (Miyagawa), 53
— Invertase (Lewis and Hill), 197
— Juice Acidity (Gorham), 261
— — — and Gall Bladder (Behm), 575
— — after Pancreatectomy (Steinberg), 442
— — Examination (Itakura), 505
— — HCl (Michaelis), 54
— — — Estimation (Friedrich), 574; (Lanz), 575
— — in Starvation and in Fœtus (Sutherland), 261
— — in Ulcer (Kelling), 54
— — Lactic Acid (Masucci), 54
— — Lipase (Takata), 574
— — of New Born (Pollitzer), 573
— — Origin of Acid (Collip), 574
— — Secretion (Fischer), 53
— Resection (Barber and others), 505
— Residuum (Lermann and others), 261
— Secretion (Unna and Wissig), 504
— — and Alveolar Air (Dodds), 195, 432; (Dodds and Bennett), 195
— — and Blood Composition (Leist), 505
— — and Cl (Rosemann), 504
— — and Endocrines (Hess and Gundlach), 148
— — and Histamine (Rothlin and Gundlach), 574
— — and Pituitary (Hoffmann), 212
— — and X Rays (Szegö and Rother), 505
— — in Man (Heyer), 432
— — Psychic (Heyer), 493, 575
— — Suckling (Chievitz), 504
— — with Water (Sutherland), 197
Gastrin (Ivy), 198
— in Fœtus (Sutherland) 261
Gastro-Intestinal Secretion (Dodds), 432
Gelatin and Electrolytes (Loeb), 611
— and Osmotic Pressure (Palmer and others), 404
— from Bones (Manning and Schryver), 472
— Hydrolysis (Northrop), 404, 472
— Osmosis, Viscosity, etc. (Loeb), 472; (Smith), 473
" Gelidusi " (Pirquet) Relation (Hamburger and Jellenigg), 65
Gelose from Algæ (Sauvageau), 285
Gels and Electrolytes (Adair), 7
— Internal Friction (Hess), 110
— Penetration by Electrolytes (Stiles and Adair), 645
— Theory (Bradford), 404
Gentianose Hydrolysis (Bourquelot and Bridel), 97
Geo-Reactions of Plants (Schley), 101
Geotropic Response (Blackman), 290
Geotropism (Lynn), 461
— Theory (Small), 397
Germ Cells, Dictyokinesis (Ludford and Gatenby), 355
— — Structure (Gatenby and Woodger), 243
Germanium Dioxide, Action on Blood (Hammett and Nowrey), 643
Germination and Dead Leaves (Lumière), 538
— and Temperature (Munerati), 537
— Barley Pollen (Anthony and Harlan), 538

Giant Cells (Cattaneo), 616
— — Histogenesis (Levy), 482
Gigantism, Experimental and Pituitary (Uhlenhuth), 72
Gills, Development (Harrison), 631
Globulin, Maple Seed (Anderson and Kulp), 531
— of Maple (Anderson and Kulp), 285
Glochidia and Encystment (Arey), 293
Glocosporium (Hemmi), 229
Gluco-Proteins, C.H. of (Schmiedeberg), 111
Glucose and Lactose in Urine (Matthews), 6
— Estimation (Borde), 109
— — by $KMnO_4$ (Quisumbing), 5
— Excretion (Broemser and Hahn), 637
— Injection, Blood Changes (Moraczewski and Lindner), 379
— Ketolytic Action (Shaffer), 207
— Micro-Method (Fontès and Thivolle), 378
— Mobilisation and Thyroid (Sanger), 146
— of Eggs (Hepburn and St. John), 200
— Oxidation by H_2O_2 (Witzemann), 8
— Phosphoric Esters (Levene), 549
— Plant (Bridel and Arnold), 459
— Pseudo-Aldehyde Formula (Brigl), 473
— Rotation (Murschhauser), 473
— Threshold of Kidney (Goto and Kuno), 142
Glucosides, Functions in Plants (Combes), 161
— of Orchids (Delauney), 285
— Plant (Wasicky), 394
Glucuronic Acid and Liver (Chiray and Caille), 576
— — in Blood (Diebschlag), 516, 627
— — in Urine (Stepp and Diebschlag), 439
Glutamic Acid, Source of (Schmidt and Foster), 297
Glutamine (Thierfelder), 239
Glycerol Action (Simon), 524
— Bacterial Oxidation (Aubel), 459
— Effects on Blood (Simon), 131
Glycine and Glycyl-Glycine (Morris and Deeds), 174
— Anhydride, Colour Test (Sasaki), 171
Glycogen after Pilocarpine (Hornemann), 591
— and Lactic Acid (Meyerhof), 245
— and Thyroid (Parhon), 379
— Constitution (Karrer and Nägeli), 238
— Distribution (Various), 554–5
— Hydrolysis in Liver (Langfeldt), 268
— of Liver (Junkersdorf), 198; (Gruzewska and Fauré-Frémiet), 440; (Lesser), 440
— Seasonal Variations in Muscle (Maignon), 266
— Storage and Diabetes (Paulesco), 51
Glycolysis in Blood (Ambard), 52; (Mauriac), 636
Glycosuria Adrenalin (Hildebrandt), 51
— after Atropine (Rossi), 515
— after Ether (Fujii), 580
— after Vagotomy (Hildebrandt), 442
— and Acidosis (Elias and Sammartino), 322
— and Cirrhosis (Chauffard and others), 379
— and Glycæmia (Graham), 268
— and Phloridzin (Fromm), 50
— and Tissue Extracts (Schenk), 516
— in High B.P. (Hitzenberger and Richter-Quittner), 269
— in Pregnancy (Cron), 442
— in Rabbits (Fujii), 379
— Phloridzin (Ionesco and Nasta), 442
— Renal (Lothrop), 207
— Sapræmic (Higginson), 143
Glycuronic Acid. See Glucuronic Acid
Glycylcholine (Dudley), 407
Glyoxalase in Beri-Beri (Finlay), 264
Goitre (Levin), 272
— and Water Supply (Houssay), 146
Golgi Apparatus (Gatenby), 301; (da Fano), 301; (Penfield), 355; (Ludford and Gatenby), 355; (da Fano), 555
— — of Marrow Megalocytes (Jordan), 179
— Cox Method (da Fano), 109
Gonad Grafts on Eggs (Minoura), 214
— Transplantation (Moore), 328
Gonads and Hermaphrodites (Moore), 214
— Free-Martin (Willier), 213
— in Decerebrate Tortoise (de Lisi), 276
— Regeneration in Planaria (Vandel), 242
Gout and Uric Acid (Gudzent), 90
— Uric Acid Retention (Bürger), 90
Gradients, Axial (Child), 410
— Physiological (Child, Hyman), 2
— Vitality (MacArthur), 479
Grafts (Daniel), 538
— Potato (Daniel), 288
Greenhouse Climate (Johnston), 228
Growth and Carbohydrate (Osborne and Mendel), 262
— and Diet (Hume), 264
— and Pituitary (Uhlenhuth), 72
— and Size (Harris), 65
— Curves of Plants (Rippel), 160; (Schuepp), 160
— in Chlorosis (Sommerfeld), 204
— in Cow (Brody and Ragsdale), 320
— Lower Plants (Various), 538, 539
— Mechanics of Plant (Küster), 227
— New, in Plants (Simon), 227
— of Amputated Plants (Waller), 227
— of Children (Schiøtz), 141
— of Fish (Audige), 65
— of Fowl (Brody), 439
— of Oats (Sierp), 227
— of Plants (Fisher), 160; (Briggs and others), 160
— of Tadpoles (Bilski), 376
— on Protein Diet (Osborne and Mendel), 318
— on Simple Foods (Sherman and others), 263
— Plant (Waller), 94
— — Analysis of (Briggs and others), 98
Guanidine and Tetany (Nattrass and Sharpe), 446; (Klinger), 447
— Effect on Heart (Rosenow), 499
— Poisoning (Frank and others) 594
Gum Resin, *Euphorbia* (Rayband), 223
— Saline Infusions (Nonnenbruch), 568

Habit in Birds (Schut), 252
— in Snails (Buytendijk), 493
Hæmagglutinins, Phyo- (Russ and Oesterlin), 224
Hæmatoporphyrinuria (Grynfeltt and others), 517
Hæmin Crystals, Preparation (Strassmann), 13
Hæmochromatosis, Experimental (Chandler), 89
Hæmoclasic Shock and Glycosuria (Ionesco and Nasta), 442
Hæmocyanin Physio-Chemical Properties (Quagliariello), 12; (Dhéré and Schneider), 239
— Spectrum and Structure (Dhéré), 12
Hæmocytometer and Hb-ometer Values (Bürker-Giessen), 255
Hæmoglobin Aggregation (Camis), 476
— and Acid-Base Equilibrium (McLean and others), 33
— and Bacteria (Kammerer), 92
— and *B. influenzæ* (Fildes), 92
— and COHb Spectra (Hartridge), 111
— and Red Cell Counts (Bürker-Giessen), 255
— B, Al. and La on (Straub and Meier), 46
— CO_2 Curve (Buckmaster), 195
— Crystallisation (Dudley and Evans), 476
— Crystals (Amantea and Krzyszowsky), 406
— Cyanide Derivatives (Vlès), 12

Hæmoglobin Dissociation (Adolph and Ferry), 406
— Electric Charge (Michaelis and Airila), 351
— Functions in Worm (Jordan and Schwarz), 108
— Identity in Man (Adair and others), 565
— Light Absorption (Hari), 187
— of Fish Blood (Lupu), 565
— Toxic Effects (Matsumura), 527
Hæmoglobinuria, Paroxysmal (Yorke and Macfie), 334
Hæmophilia (Wöhlisch), 567
— after Transfusion (Bulger), 36
— and Fibrinogen (Rabe and Salomon), 37
— and X Rays on Spleen (Neuffer), 80
Hæmolysin Activity (Ponder), 598
Hæmolysins of Urine (Ponder), 63
Hæmolysis and Bile Salts (Ponder), 625
— and Lipoids (Jarisch), 154; (Clark and Evans), 282
— and Structure (Bechhold), 34; (Sálen), 34
— by $CHCl_3$ and Alcohol (Apitz and Kochmann), 33
— by Metallic Ions (Waterman), 495
— by Quinine (Luger), 366
— Effect of Temperature (Jarisch), 625
— Sensitiser and P_H (Coulter), 190
— Synergy in (Handovsky), 526
Hæmorrhage, Blood Reaction (Evans), 309
— Death from (Zunz and Govaerts), 597
— Effect on Oxygen Intake (Schlomowitz and others), 195
— — on Sympathetics (McGuigan), 382
— Effects (Doi), 425
— Reaction to (Meek and Eyster), 259
Hæmostatic Serum (Hamilton), 332
Haliotis, Pigments of Shell (Kodzuka), 552
Haustoria of *Cuscuta* (Gertz), 232
Hearing, Central Beats (Kreidl and Gatscher), 126
— in Lepidoptera (Stander), 300
— in New Born (Waltan), 621
— Presbyacusis (Meyer), 28
— Resonance Theory (Hartridge, Perrett), 250; (Hartridge), 184, 562
— Sound Energy (Kranz), 621
— Theory (Bohring and Titchener), 27
— Threshold (Marage), 27
Heart Acceleration in Exercise (Glaus), 41
— Alkaloids on (Hanzlik), 590
— Alkyl Chlorides on (Kiessling), 219
— Alternation (Koch), 42; (Kisch), 43; (de Boer), 628
— and Circulation in Work (Bruns), 427
— and Ganglion of Tunicate (Day), 354
— and Ionium α-Rays (Levend), 629
— and K (Libbrecht), 42
— and Parasympathetic Drugs (Kolm and Pick), 500
— and Radio-Activity (Jannink and Feenstra, Zwaardemaker), 428
— and Respiration (Pearce), 136
— Antagonisms and Reinforcement, (Burridge), 192
— Arborisation Block (Drury), 314
— Arrest by Vagus Pressure (Blanton), 258
— Auricle Tracing (Fredericq), 569
— Aviator's (Le Wald and Turrell), 132
— Beat, Review (Eyster and Meek), 40
— Bled Frog's (de Boer), 499
— Block (Straubel), 42; (Smith), 42; (White), 427
— — and Fibrillation (Danielopolu and Danulesco), 428
— — Apparatus (Eddy), 402
— — Incomplete (Wilson and Herrmann), 314
— — Intraventricular (Oppenheimer and Pardee), 43
— — Vagal (Lewis and Cotton), 314
Heart Caffeine, etc., on (Heathcote), 154
— Calcium and Sympathetic (Kolm and Pick), 369
— — Lack (Hansen), 314
— Cardiac Cycle (Wiggers), 192
— CO_2 on Frog's (Burridge), 192
— Colloidal Nutrients (Zondek), 500
— Conducting Tissue (Skramlik), 427
— Conduction and Nicotine (Barry), 313
— — in (Barry), 569
— Contraction and E.C.G. (Hoffmann), 41
— Disease, Exercise Treatment (Barringer), 370
— Drugs, Ca and K (Zondek), 87
— Effect of Barium (de Boer), 192; (de Arric), 313
— — of Cations (Loewi), 258
— — of Cocaine on (Kochmann), 500
— — of Ions (Zondek), 499
— — of Methylene Blue (Heymans and Maigre), 313
— Electric Axis (Dieuaide), 427
— — Changes in Chick (Külbs), 132
— Extra Pause (de Boer), 43, 499
— Fibrillation (Semerau), 43; (de Boer), 43
— — and Tachycardia (de Boer), 369
— Flutter and Fibrillation (Lewis and Cotton), 314
— Frog, Registration of A. and V. (Amsler), 4
— Ganglion, Respiration (Garrey), 615
— Gaseous Exchanges (Lüscher), 40, 256
— Guanidine on (Rosenow), 499
— Heat Paralysis (Libbrecht), 569
— Hypertrophy (Geigel), 570
— Hypodynamic Effect of Serum on (Freund), 571
— i-Inositol on (Hewitt and de Souza), 131
— in Diphtheria (Smith), 499
— in Exercise (Hiramatsu), 498
— Innervation in Frog (Cori), 568
— in Rarefied Air (Hindmarsh), 369
— Interpolated Contractions (Myers and White), 257
— Ionic Balance (Libbrecht), 569
— Ions, Lipoids, etc. (Loewi), 131
— — on Frog (Daly and Clark), 192
— Irregularity and Atropine (Bishop), 369
— K and Automatism of (Kolm and Pick), 131
— K and Radioaction (Zondek), 500
— K, Ca and Poisons (Zondek), 42
— Law of (Starling), 369
— Mg on (Matthews), 369
— Moribund, Arrhythmia (Dieuaide and Davidson), 628
— Muscle, Creatine (Constabel), 487
— — Dynamics (Machiela), 429
— — Excitability, etc. (Lewis and Drury), 312
— — Glycogen in (Rojas), 554
— Necrosis and Thyroid (Goodpasture), 519
— Nerves, Mode of Action (Loewi), 427
— Nicotine Action (Hett), 42; (Barry), 132
— of Snake (Kupelwieser), 131
— Operations on (Carrel), 570
— Origin of Beat (Hering), 131
— Output (Stewart), 498
— — and Pulse Pressure (Skelton), 570
— — Conditions (Wiggers), 256
— Perfusion Fluid for Frog (Burridge), 312
— Periodicity of Ventricle (de Souza and Hewitt), 628
— Poisons, Paradoxical Action (Pick), 80
— Polar Stimulation (Rosenberg), 41
— Problems of (Starling), 627
— Rate of, and Endocrines (Cannon and Rapport), 639
— Reflex Inhibition (Vinnis), 40
— Refractory Phase (Dennig), 41
— Replacement of Cl-Ion (Finckh), 500

Heart Rhythm Changes (de Boer), 43
— Sinoventricular Bundle (De Cady), 312
— Sound, Third (Ohm), 369
— Sounds (Wiggers), 498
— — Auricular (Reid) 192
— — Record (Williams) 294
— Stannius Ligature (Hoffmann), 41
— Strychnine Action (Frey), 42
— Summation and Tetanus (Frey), 22
— Transposed E.C.G. (Inada), 132
— Vagus Functions (Haberlandt), 40, 499
— — Tonicity (Fredericq and Descamps), 313
— Venous Return, etc. (Wiggers), 256
— — Supply (Burton-Opitz), 627
Heat, Effect on Mice (Richet), 609
— of Inversion of Sucrose (Dixon and Ball), 14
— Paralysis, Heart (Libbrecht), 569
— — in Crabs (Fröhlich and Kreidl), 116
— — in Plain Muscle (Evans), 118
— Polypnœa (Almeida), 430
— Production (Gayda), 636
— — during Development (Gayda), 578
— — of Muscle (Galeotti), 357
— Regulation (Barbour), 268
— — after Intravenous Injections (Jacobi), 322
— — and Collapse (Diehl), 84
— — Nervous (Barbour and Tolstoi), 321
— Stroke (Richet), 589
— Tachypnœa (Ogata), 142
Heliotherapy in Alps (Rollier), 151
Heliotropism (Small), 101
— Theory (Garrey), 17
Hellebore, Deacetylated (Frey), 628
Hepato-Duodenostomy (Dunn and Connell), 505
Heredity, Chromosome Theory (Huxley), 523
— Institute, Akarp (Nilsson-Ehle), 166
— Laws of (Verlaine), 235; (Hensen), 236
Hermaphroditism (Moore), 214; (Mittasch and others), 641
— and Interstitial Cells (v. Keussler), 77
Heterothallism (Cutting), 289
Homogentisic Acid (Mörner), 613
— — and Acetone (Katsch), 268
Honey Ripening (Sarin), 435
Hookworm in Brazil (Darling and Smillie), 282
Hormones and Body Temperature (Adler), 69
— Various (Abderhalden and Gellhorn), 213; (Several authors), 383
Hot-Wire Methods (Hill), 548
Hibernation and Hormones (Adler), 69
— in Cold (Aszódi), 206
— R.Q. in (Hari), 206
High Altitude, and Heart (Le Wald and Turrell), 132
— — Blood Regeneration (Kestner), 130
— Blood Pressure (Elliott), 391
Hippuric Acid Excretion (Violle), 145
— — Estimation (Kingsbury and Swanson), 549
— — in Nephritis (Kingsbury and Swanson), 204
— — Kidney Test (Kingsbury and Swanson), 444
— — Metabolism (Snapper), 377
— — Synthesis (Lewis), 205; (Violle), 324
Hirudin and Agar-Toxic Serum (Zunz and Geertruyden), 36
Histamin and Peptone on Intestine (Olivecrona), 262
— and Pituitary (Dale and Dudley), 584
— and Tissue Extracts (Rothlin), 149
— Injection in Man (Schenck), 332
— Shock, Capillaries in (Rich), 156
Histidine Estimation (Thrun and Trowbridge), 111
Histogenesis Dynamics (Carey), 179, 617
Humic Acid (Fuchs), 223
Humidity and Heat in Mines, Effects of (Sayers and Herrington), 1
Hunger Centre (Pavlov), 559
— Osteomalacia (Dalyell and others), 508
Hybrid Bean (Sirks), 232
Hydrocarbon Analysis, Bacterial (Tausz), 163
Hydrocarbons, Benzine, Effects (Fühner), 217
Hydrocephalus (Dandy), 308; (Wislocki and Putnam), 420
Hydrocuprein-Alkyl Derivatives (Bylsma), 81
Hydrocyanic Acid Estimation in Cadaver (Chelle), 8
— — in Pasture (Swanson), 200
— — in Plants (Menaul), 285; (Rosenthaler), 337
— — in Sudan Grass (Swanson), 599
— — Bacterial Production (Patty), 397
Hydrofluoric Acid Poisoning (Kockel and Zimmermann), 87
Hydrogen Electrode Error (Evans), 108
— — Titration (Hastings), 237
— Ion (Traube), 407
— — Activity (Northrop), 404
— — and Heat Coagulation (Okuda and Zoller), 612
— — Colour Comparator (Barnett), 108
— — Concentration (Evans), 497
— — — Blood (Evans), 424
— — — by Indicator (Felton), 237; (Michaelis), 237
— — — for Bacteria (Various), 539, 540
Hydroxy Amino-Acids (Dakin), 550
Hyoscines and Hyoscyamines (Cushny), 153
Hyperglycæmia, Adrenaline (Tatum), 520
— and Tumours (Rohdenburg), 380
— Pilocarpine (Hornemann), 591
— See also Blood Sugar
Hyperthyroidism (Boothby), 446
— Heart Failure (Goodpasture), 382
Hypertonic Body Fluids (de Boer), 2
— Injections (Stejskal), 453

Ichthyol, Anticoagulant Action (Chistoni), 83
Ileocæcal Valve Insufficiency (Hannes), 54
Illusion of Motion (Richet), 563
Imidazolisopiperidin Action (Dale and Dudley), 590
Immersion Fluid (Jensen), 294
Immune Precipitation (Doerr and Berger), 612
Immunity and Anaphylaxis (Arthus), 91; (Dale and Kellaway), 155
— in Insects (Paillot), 115, 116
— of Premature Infants (Kyrklund), 284
— to Cobra Venom (Gunn and Heathcote), 87
Inanition, Organs in (Kreger), 66
Incitamin (Fischer), 526
Indican of Blood (Becher), 270
— of Serum (Snapper and Vloten), 39
— of Tissues (Becher), 63
Indicator Method (Michaelis and Krüger), 403
— — for H-Ion (Michaelis), 4, 350
— New (Kinkead), 5
Industrial Fatigue (Ryan and Florence), 169
Infant Foods, Digestibility (Schmiesing), 137
Infection in Invertebrates (Couvreur and Chahovitch), 243
— Mistletoe (Heinricher), 465
Infections, Blood in (Hirsch), 392
Infinitely Little (Halliburton), 293
— — Importance of (Halliburton), 107
Influenza Bacillus (Jacoby and Frankenthal), 648
Infusoria Food Reactions (Woodruff and Spencer), 297
— Membranes (Bresslau), 297
— Micro- and Amicronucleate (Woodruff), 551
— Multiplication (Robertson), 614

Inhibition and Volition (Fano), 123
— Central (Brücke), 22; (Ebbecke), 124
— Mechanism of Reflex (Whitaker and Forbes), 181
Insect Scales, Colour (Onslow), 411
Instinct and Unconscious (Rivers), 126
— of Animals (Szymanski), 31
Intelligence Tests (Dunlop and Snyder), 31
Internephridial Organ (Harms), 16
Interstitial Cells, Functions (Kohn), 77
Intertraction (Wright), 221
Intestinal Absorption (Telfer) 432; (Goldschmidt), 506
— Fistulæ (Volta), 433
— Flora (Cheplin and Rettger), 92
— Obstruction (Ribeyrolles), 456
— Poisoning (Okubo), 596
— Toxines (Schloss), 155
— Tube (Einhorn), 236
Intestine, Amino-Acids in (Abderhalden), 317
— CO_2 as Stimulus (Mansfeld), 359
— Contents P_H (McClendon), 432
— Contraction and Suprarenal (Mira and Fontes), 272
— Drugs on (Leeuwen and Broeke), 454
— Frog, for Pharmacology (Schüller), 433
— Histamine and Peptone on (Olivecrona), 262
— Hormones (Heymanns), 506
— in Drug Testing (Hammett), 198
— Inulase of (Sluiter), 261
— Large, Peristalsis (Zondek), 137
— Movements (Kühlewein), 575; (Wertheimer), 575
— — and Choline (Le Heux), 505
— — and Splanchnic (Wertheimer and Duvillier), 632
— NaCl Absorption (Cobet), 198
— Opium on (Uhlmann and Abelin), 82
— Reaction of Contents (McClendon and others), 54
— Secretion in Embryo (Parat), 317
— Small, Resection (Toida), 138
— — Structure (Carey), 261
Intracranial Pressure after Salt Solutions (Sachs and Malone), 185
— — and Hypertonic Injections (Cushing and Foley), 32
Intra-Ocular Pressure (Stein), 470
Intravenous Injection (Roth), 170
Intravitam Staining of Fœtus (Wislocki), 277
Inulin (Karrer and Lang), 238; (Bourquelot and Bridel), 351
— Hydrolysis (Bourquelot and Bridel), 535
Inulinase of Intestine (Sluiter), 261
Invertase Action (Michaelis and Rothstein), 96
— Dynamics (Michaelis), 175
— in Roots (Knudson), 160
— of Gastric Juice (Lewis and Hill), 197
— of Mould Spores (Kopeloff and Byall), 536
Invertebrates, Composition (Botazzi), 113
— Defence against Bacteria (Couvreur and Chahovitch), 243
Iodine and Thyroid, Effects (Cameron and Carmichael), 69
— Compounds and Larvæ (Abelin), 519
— Effects on Blood (Dorlencourt and others), 386
— of Tissues (Kendall), 211
— Values, Abnormal (MacLean and Thomas), 296
Iodised Proteins (Blum and Strauss, Strauss and Grutzner), 10
Iodoform Substitutes (Bachem and Kriens), 407
Iodopropyl Alcohols, Action (Mancini), 218
Ion Antagonism and Colloids (Neuschlosz), 110; (Handovsky), 110
— Series and Proteins (Loeb), 7
Ion Uptake by Cells (Rosenthaler), 355
Ionic Balance (Feenstra), 628
— — and Drugs (Zondek), 593
Ionium Hydroxide and Heart (Levend), 629
Ipecac in Entero-Hepatitis (Wegeforth), 280
Iris Pigmentation and Sympathetic (Waardenburg), 124
Iron, Colloidal, and Metabolism (Langfeldt), 440
— Effects of (Sabbatani), 454
— Organic, Estimation (Nicloux and Welter), 295
— Pharmacology (Sabbatani), 594
Irritability of Plants (Löffler), 164; (Sierp), 164
— Plant (Grafe), 232; (Bibb, Small), 604
Islands of Langerhans in Glycosuria (Dubreuil and Anderodias), 143
Iso-Electric Point Apparatus (Szent-Györgyi), 7
Ivy, Poison (Brown), 390

Jaundice, Bile Pigment in (Rosenthal and Meier), 595
— in New Born (Schick), 215; (Wagner), 215
— Stercobilin in (Brulé), 199
Juniper Oil (Shinosaki), 286
— — Action of Acids (Huerre), 159

Ketogenesis and Antiketogenesis (Schaffer), 443
Ketosis and Glucose (Shaffer), 207
Kidney after Anæsthesia (McNider), 380
— and Poison Gases (Richaud), 144
— Capillary Pressure (Hill), 259
— Disease, Residual N in (Rosenberg), 144
— Effect of Cold (Cicconardi), 637
— Efficiency and Hyperglycæmia (Maxwell), 142
— — Tests (Weiss), 63; (Carnot and others), 323; (Violle), 324; (Magarth), 324
— Embryology of (Kampmeier), 323
— Extracts, Vagal Effects (Roger), 591
— Function. See Renal Efficiency
— — Test (Pedersen), 64
— Functions (Voigt and Fritz), 444
— Glucose Threshold (Goto and Kuno), 142
— in Siamese Twin (Morpurgo), 581
— Metabolism (Costantino), 517
— Nerve Section (Ellinger), 444
— Oxygen Usage (Tamura and Miwa), 144
— Pelvis Movements (Wasfink), 270
— Perfusion (Barkan and others), 637
— Secretion (Stieglitz), 207; (Marshall and Crane), 208; (Hill and McQueen), 516; (Salkowski), 517; (Tamura and Miwa), 517
— — in Frog (Parnas), 210
— — Mechanism (Stieglitz), 580
— Urea Excretion by (Oliver), 145
— — Secretion (Menzies), 208; (Austin and others), 208
Kjeldahl Method (Daudt), 350

Labyrinth and Equilibration (Lombard), 28
— Functions of Otic (Prince), 28
— in Tadpoles (Herter), 419
— Otolith Functions (de Kleijn and Magnus), 28
— Reflexes (de Kleijn and Magnus), 29
Lactacidogen in Muscle (Various authors), 483-4
Lactalbumin Hydrolysis (Johns and Jones), 173
Lactation and Ovulation (Loeb and Kuramitsu), 216
— Milk in (Weiser), 523
Lactic Acid Formation (Tomita), 474
— — in Anoxæmia and Shock (Macleod), 196
— — in Blood (Clausen), 188; (Hastings), 487
— — of Muscle (Meyerhof), 245, 556
— — Precursor (Embden), 484; (Laquer), 487
— — Test (Hartwig and Saar), 238

Lactic Bacteria, Mutation (Gorini), 460
Lactones as Anthelmintics (Lautenschläger), 643
Lactose Estimation (Adriano), 171; (Legrand), 238
— in Urine (Herzberg), 444
— Injection and Milk (Porcher and Tapernoux), 378
Lævulinic Acid in Foods (Grünhut), 507
Lævulose Tolerance and Liver (Spence and Brett), 632
Lake Vegetation (Pearsall), 103
Lard, Nutritive Value (Drummond), 577
Lathyrism (Mirande), 281, 531
Lead Alkyl Compounds (Mason), 330
— Organic Compounds (Mason), 388
— Precipitation (Langecker), 477
Leaf Coloration (Westermeier), 644
— Proteins (Chibnall and Schryver), 285
Learning, Movement Integration (Ulrich), 252
Leaves, Adaptation (Mágocsy-Dietz), 290
Le Chatelier's Theorem (Roaf), 172
Lecithin, Brain (Levene and Rolf), 239
— Liver (Levene and Sims), 475
Lecithins of Egg Yolk (Levene and Rolf), 199
Lecture Experiments (Rossi and Spadolini), 402
Leech Preparation (Teschendorf), 61
Left-Handedness in Children (Gordon), 185
Lens and Fluorescence (Schanz), 561
— of *Amblystoma* (Harrison), 26
— Precipitins (Hektoen), 357
— Regeneration (Ogawa), 305
— Relation to Pupil (Seidel), 27
Leucine, Bacterial Breakdown (Arai), 645
Leucocyte Count and Digestion (Müller), 55
— — and Light (Clark), 35
— — and Posture (Jörgensen), 35
— — and Radium (Traugott), 35
— Reactions (Grenet and others), 129
Leucocytes, Acids and Phagocytosis (Evans), 177
— after Ultra-Violet Rays (Baumann), 625
— and Osmosis (Maltaner and Hoppe), 35
— Chemotaxis (Wolt), 482
— Eosinophile (Zibordi), 482
— Frog, after X Rays (Sturges and Levin), 495
— from Spleen (Melczer), 32
— Lipoids of (Savini), 300
Leucocytic Exudate and Autolysis (Bordet and Ciuca), 91
Leucocytolysis (Manoukhin), 156
Leucocytosis, Digestive (Adelsberger), 434
— Nervous Influence on (Tinel and Santenoise), 565; (Pagniez), 565
Lichen Algæ Cultures (Warén), 162
— as Transmigrant (Church), 336
Life (Lipps), 169
— in Rocks (Galippe and Souffland), 293
Light, Action on Beetle (Moore and Cole), 16
— — on Plants (Schanz), 167
— and Metabolism (Liebesny), 66
— and Plants (Meyer), 232
— Catalysts (Noack), 458
— Effect on Spores (Hurd), 100
— Filters, Gelatin (Pringsheim), 159
— on Crabs (Fröhlich and Kreidl), 116
— on *Cyanophyceæ* (Bodesch), 159
— on Plants (Harder), 461; (Zollikofer), 462
— Perception by Plants (Heilbronn), 231
— Reactions, Ascidian (Mast), 412
— Sensitisation (Schanz), 469
— Sensitivity to (Hecht), 363
— Spot Adaptation (Dunlap), 184
— Stimulus by (Hecht), 16
— Ultraviolet, Eosin Sensibilisation (Gassul), 80
Light, Ultraviolet, for Cytological Experiments (Tchahotine), 18
— — on Nereis Eggs (Redfield and Bright), 298
— — Penetration of (Baldwin), 293
Lightning Injury to Plants (Various), 343
Lignin, Characters (Beckmann and Liesche), 644
Lime and Magnesia for Plants (Pfeiffer and Rippel), 602; (Nolte), 602
— on Wheat (Le Clerc and Breazeale), 537
Liming Soil (Griffith), 601
Lingual Nerve Section (Olmsted), 307
Lipæmia (Feigl), 189
Lipase, *Aspergillus* (Schenker), 534
— Liver (Christman and Lewis), 409
— Malt (Van Laer), 226; (Maestrini), 600
— of Succus Entericus (Roger and Binet), 506
— Poisoning by Atoxyl (Rona and Bach), 14
— Renal (Levine and Gianelli), 208
Lipochrome, Nature (Kreibich), 118
— Serum (Bergh and Muller), 189
Lipoids, Blood, and Fever (Gabbe), 568
— Microchemical Detection (Czapek), 159
— of Blood (Bloor), 189; (Feigl), 189
— of Liver (Le Breton), 612
— of Tissues (Nagayama), 470
Liver Acute Yellow Atrophy (Foulerton), 390
— after Atropine (Rossi), 389
— and Blood Concentration (Lamson and Roca), 576
— — Sugar (Mann and Magath), 207
— and Brain (Renault-Capart), 122, 305; (Crile), 456
— and Heart Rate (Cannon and others), 639
— Cells (Grynfeltt and Lafont), 413
— Effect of Anæmia (Chandler), 55
— — of Anæsthesia on (Widal and others), 317
— — of Spleen Extirpation (Silvestrini), 55
— Excision in Frog (Ronca), 576
— Extirpation, Blood in (Mann and Magath), 188
— Fat and Glycogen (Junkersdorf), 632
— Function Test (Chiray and Caille), 576
— Glycogen Content (Junkersdorf), 138
— — Storage (Junkersdorf), 198
— in Disease (Hoppe Seyler), 506
— Insufficiency (Spence and Brett), 632; (Aaron and others), 632
— Mitochondria (Noel), 301
— Necrosis (Davis), 451
— — and Regeneration (Davis and Whipple), 387
— of Hedgehog (Chaves), 356
— Pigmented Degeneration (Ladreyt), 335
— Purgatives, Action on (Einhorn), 138
— Removal in Dogs (Mann), 138
— Salts on (Einhorn), 591
— Structure and Nutrition (Berg), 55
— — of Perfused (Skramlik and Hünermann), 55
— Urea of (Fosse and Rouchelman), 262
— Volume Changes and B. P. (Edmunds), 591
— Yellow Atrophy (Feigl), 221
Living Organism (Forster), 469
Lobeline, Action on Respiratory Centre (Eckstein and others), 279
Locomotion of Holothurian (Parker), 176
Loganberry Chemistry (Daughters), 159
Loranths (Le Plastrier), 538
Lubia, Rust Disease (Hefnawi), 607
Luciferase, Nature (Kanda), 114
Lues' Reaction, Precipitate in (Lieb), 393
Lung Automatism and Reflexes (Carlson and Luckhardt), 45; (Luckhardt and Carlson), 194
— Effect of Vagotomy in Frog (Patterson), 194
— Growth of (Fauré-Fremiet), 556

Lung Infection Path (Winternitz and others), 93
— Microchemical Reaction of Epithelium (Fauré Fremiet and others), 19
— Motor Mechanism in Reptiles (Luckhardt and Carlson), 122
— Nerve Endings (Larsell), 193
— Vagus and (Patterson), 630; (Larsell and Mason), 60
— Vasomotor Nerves Mashima), 489
— Vasomotors in Vagus (Luckhardt and Carlson), 260
— Volume Determination (Van Slyke and Binger), 259
Lungs and Skin Inter-Relations (Azzi), 372
— Circulation and Blood Content (Stewart), 629
Lupins as Food (Funaro and Musante), 632
Lycorine Distribution (Gorter), 532
Lymph Formation (Jappelli), 135; (Meyer-Bisch), 567
— Node Cultures (Lewis and Webster), 480
— Reaction (Chistoni), 497
Lymphagogues (Chistoni), 522
Lymphatics, Œdematous (Clark), 259
Lymphocyte Count and Gastric Juice (Pavlovsky), 55
Lymphocytes and Chemotaxis (Bergel), 19
— Fate of (Bunting and Huston), 367
— Migration in Cultures (Lewis and Webster), 116
Lymphoid Tissue and Nutrition (Cramer and others), 633
— — Germ Centres (Nakahara and Murphy), 356
— — of Intestine (Latta), 356

Maculæ Acusticæ Orientation (Oort), 28
Magnesium and Ca in Serum (Kramer and Tisdall), 425
— Estimation (Kramer and Tisdall), 109; (Tisdall and Kramer), 548
— Manures (Schnitzler), 230
— on Heart (Matthews), 369
Mahua Flower (Fowler and others), 532
Maize Flour Extraction (Michiels and Hennes), 224
Malaria by Inoculation (Dyk), 393
Malic Acid, Fate in Body (Tomita), 635
Malnutrition in Children (Clark), 266
Malt Extraction (Chabot and Van Laer), 537
Maltase (Willstätter and Steibelt), 395
— and α-Glucosidase (Willstätter and Steibelt), 353
Maltose Estimation (Legrand), 238
Mammary Gland, Opossum (Hartman), 216
— — Physiology of (Kuramitsu and Loeb), 277
Manganese in Legumes (Jones and Bullis), 599
— in Molluscs (Boycott), 614
— in Plants (Wester), 531, 532
— Ores, Effects (Reiman and Minot), 84
Manometer Float (Blankenhorn and Warnick), 470
Manures and Phosphates (Zielstorff), 602
— and Plant Composition (Münter), 606
— and Salts (Gerlach), 602
— Humic Acid (Lemmermann and Weismann), 99
— Utilisation (Mitscherlich), 230
— See also Fertilisers
Marching, Physiological Cost of (Waller and de Decker), 64; (Magne), 64
Marine Animals, Semipermeability (Dekhuyzen), 354
Massage and Electricity Effects (Hartman and Blatz), 180
Mastication Dynamometer (Hürthle), 108
Meats, Various, as Food (Holmes and Deuel), 56
Medical Research (Vincent), 107
Medicinal Plants (Kremers), 94
Medicine, Institutes of (Paton), 1
Medulla, Anæmia of (Winkin), 273
Medulla Sensory Lesions (Bergmark), 560
Medusæ, Temperature and Drugs on (Schaefer), 241
Melanin (Salkowski), 111
— from Pyrrole (Rondoni), 174, 351
— Ingestion by Cells (Smith), 554
Melanin of Skin (Young), 240
Melanuria and Pyrrole (Saccardi), 513
Membrane Potentials (Loeb), 295
Menstrual Disorders (Esch), 157
— Fluid, Blood Cells of (Stickel and Zondek), 78
— — Composition (Oliver), 77
Menstruation and Blood Creatinine (Wang and Deutler), 78
— Blood in (Rosenbloom), 380; (Eisenhardt and Schaefer), 385
— Conditions of (Meyer-Rüegg), 77
— Metabolism (Blunt and Dye), 376
— Resumption of, P.P. (Rucker), 450
Mental Efficiency Tests (Kohs), 31
— Tests (Potts), 127
Mercapturic Acid Excretion (Kapfhammer), 612
Mercuric Chloride Poisoning (MacNider), 152
Mercury, Action of Salts (Salant and Kleitman), 453
— Injections, X-Ray Study (Cole and others), 217
— Saligenin (Hirschfelder and others), 152
Mesenchyme Cells, Effect of $KMnO_4$ (Lewis), 19
— Digestive Activity (Danchakoff), 599
Metabolic Gradient in Annelids (Hyman and Galigher), 354
— Gradients (Child, Hyman), 2
Metabolism after Castration (Heymanns), 503
— after Food (Corinaldesi), 267
— after S Injections (Bisch and Basch), 377
— after Splenectomy (Asher and Koda), 503
— and Body Surface (Lapicque), 376; (Pfaundler), 376
— and Thyroxin (Plummer and Boothby), 211
— at Seaside (Häberlin and Müller), 141
— Basal, Apparatus (Jones), 141
— — in Diagnosis (Fussell and Jonas), 141
— — in Women (Blunt and Dye), 376
— — See Basal Metabolism
— during Development (Gayda), 578
— in Convalescent Home (Müller), 141
— in Fencing and Wrestling (Gullichsen and Soininen), 431
— in Swimming (Waller and Decker), 636
— in Tropics (Caspari), 266; (Eijkman), 266
— in Vascular Hypertonia (Hitzenberger and Richter-Quittner), 269
— in Walking and in Miners (Waller and de Decker), 204
— Infantile Atrophy (Fleming), 65
— Intermediary and Light (Liebesny), 66
— N and Cl (Nelson and Kinney), 204
— Nervous Regulation (Brugsch and others), 67
— of Adolescent (Wright), 65
— of Cattle (Armsby and others), 68
— of Children (Benedict and Talbot), 511
— of Eunuch (Read), 267
— of Fattening Pigs (Wellmann), 376
— of Frogs (Azzi), 438
— of Girls (Benedict and Hendry), 266
— Regulation by Brain (Rogers and Wheat), 490
Metacholesterol of Wool Fat (Lifschütz), 238
Metals, Fungicidal (Wöber), 465
— Heavy, Action on Heart (Salant and Kleitman), 388
— — on Plants (Kahho), 647
Metamorphosis (Fulton), 107
Methæmoglobin from COHb (Kruse), 187
— in Pneumonia (Stadie), 284

Methods, Biochemical (Slosse), 237
Methyl Bromide Poisoning (Löffler and Rütimeyer), 84
— *d*-Mannoside Hydrolysis (Herissey), 534
— Glucoside Hydrolysis (Bridel), 535
Methyl-Histamine Action (Dale and Dudley), 590
Methylation in Body (Tomita), 513
Methylene Blue Action (Koskowski and Maigre), 416
— — and Bacteria (Schnabel), 645
— — Effects (Koskowski and Maigre), 469
— — — on Temperature (Heymans and Maigre), 390
— — Reduction (Ahlgren), 414; (Ohlsson), 414; (Schulman and Justin-Besançon), 547
Microrespirometer (Adam), 5
Microrespirometry (Jordan and Schwarz), 108
Microsomes (Guilliermond), 222
Microscopic Technique (Metz), 294
Micro-Volumetric Methods (Hamburger), 402
Micturition and Hind Brain (Barrington), 361
Milk and Amino-Acids of Blood (Cary), 216
— and Diet (Hart and others), 588
— and Fodder (Hess and others), 60, 61; (Dutcher and others), 61
— Bromides in (Bogert), 527
— Catalase of (Machens and Cordes), 151
— Chemistry (Various authors), 386
— Chlorides (Sisson and Denis), 523
— Cholesterol (Wacker and Beck), 216
— Citric Acid in (Supplee and Bellis), 642
— Cl, Ca, Mg, PO_4 Estimation (Takeno), 477
— Cow's, in Human (Kappeller and Gottfried), 150
— Digestibility (Gabathuler), 61
— Dilution for Infants (Fetscher), 277
— Dried (Johnston), 509
— — as Food (Burnet), 140; (Blackham), 277
— Effect of Diet on (Hartwell), 277
— — on Tissue Respiration (Feudenberg and György), 56; (Freudenberg and Mammele), 61
— Feeding (Pfaundler and Schübel), 523
— Food (Mattill), 434
— Formalin Reaction in (Reiss), 277
— Goat's (Schultz and Chandler), 216; (Calvin), 588
— Hygiene (Kitchen), 277
— Hygienic (Williams), 642
— Lactose Estimation (Owen), 6
— Organic Acids (Kramer and Greene), 216
— Pentoses (Laxa), 588
— Powders, Antiscorbutic Property (Hart and others), 264
— Production and Diet (Hartwell), 318
— Reaction by Dialysis (Kramer and Greene), 216
— Reductase and Radiation (Reinle), 216
— Secretion and Diet (Hartwell), 642; (Tocher and others), 642
— Substitutes for Calves (Caldwell), 58
Mirror Writing (Gordon), 185
Mitochondria (Guilliermond), 222
— of Marrow Megalocytes (Jordan), 179
— Plant (Guilliermond), 158; (Dubois), 158
Mitosis (Chatton), 554
— and Osmotic Pressure (Vlès and Dragoiu), 241
— and Viscosity (Heilbrunn), 553
— Heterotype of Corethra (Dehorne), 241
Mixing, Order of (Karczag and Hajós), 529
Molecular Weight by Hydrolysis (Colin and Chaudun), 535
Mullusc Shell Prisms (Schmidt), 411
Monkey Intelligence (Buytendijk), 30
Monocytes, Oxidases in (Schlenner), 11
Morchella Cultivation (Falck), 229
Morin and Quercitrin (Justin Mueller), 95
Morphine and Antipyretics (Rhode), 590
— and Septicæmia (Kraft and Leitch), 525
— Antidotes (Bornstein), 390
— Effect on Alkali Reserve (Gauss), 153
Morphine, Effect on Metabolism (Schübel), 82
— Estimation (Wachtel), 452
— etc., on Heart (Hanzlik), 590
— Fate of (Tamura), 525
— — in Body (Tamura), 153
— on Stomach (Jarno and Marke), 590
Morphogenesis in Planaria (Child), 299
Mosquitoes, Effect of Temperature (Flu), 115
Mosses, Analyses (Piccioli), 159
Motility in Animals (Ward), 22
Motor Control Test (Spaeth and Dunham), 365
Mouse, White, Life of (Kirkham), 2
Mouth and Nose Piece (Moore), 236
Movements, Integration in Learning (Ulrich), 252
Mucilages and Dyes (Lloyd), 457
Mucin, Hyaloidin, etc. (Schmiedeberg), 111
— %N and Precipitation of (Dejust), 12
Muscarine and Derivatives (Brabant), 333
— and Pseudomuscarine (Weinhagen), 86
— Fungi (Fahrig), 86
Muscle, Acetaldehyde in (Hirsch), 316
— Action Current (De Meyer), 120
— — Currents and Reflexes (Salomonson), 182
— after Contraction (Schwartz and Meyer; Pinkhof), 417
— and Nerve, Electrical Energy Changes (Hill), 247
— — in Rickets (Bourguignon and Banu), 246
— and PO_4 (Embden and others), 484
— Atrophy (Lipschütz and Andova), 415
— — Loss of N (Peters and Guenther), 181
— Autonomic Innervation (de Boer), 486
— Carbohydrate Metabolism (Parnas), 485; (Laquer), 487
— Chemical Dynamics (Hopkins), 557
— Chemistry (Quagliariello), 303
— Chronaxie in Degenerated (Bourgnignon), 304
— — in Infants (Banu and others), 304
— Cold Contracture (Botazzi), 118
— Contraction (v. Kries), 485
— — and Rigor (Schaefer), 118
— — Heat Production (Doi), 303
— — in Crayfish (Sheng and Schilf), 246
— — Theories (Herzfeld and Klinger), 21; (v. Fürth), 180; (Schmitz, Hürthle), 358; (Wacker), 416
— Contracture and Sympathetic (Schäffer), 120
— Creatine (Hammett), 557; (Schönfeld), 558
— Deformation Currents (de Meyer), 120
— Denervated, Regeneration (Hartman and Blatz), 180
— Development (Anders), 304
— Diabetic, Metabolism (Parnas), 485
— Double Innervation (Wilson), 415
— Effect of Cold (Foster and Moyle), 303
— — of Novocaine (Fulton), 483
— — of Physostigmine and Scopolamine (Frank and Nothmann), 486
— Efficiency and O_2 Use (Parnas), 485
— Electric Currents (de Meyer), 303; (Hanàk), 557; (Adrian and Owen), 557; (Vœlkel), 557
— Energy Supply (Meyerhof), 118; (Hartree and Hill), 118, 302
— Excitable Substances (Houssay and others), 248
— Excitability (Edström), 414
— — and Ca (Nothmann), 557
— — and CO_2 (Mansfeld), 359
— — in Man (Strohl), 609

Muscle Extensibility (Eddy and Downs), 246
— Fatigue Curves (Dausset and Boiget), 235
— — in Alcohols (Baldwin), 246
— Glycogen (Takenuchi), 555
— Imbibition by, in Sn Solutions (Drouin), 246
— Inexcitable, in Children (Bossert and Gralka), 179
— Innervation and Tone (Kahn), 618; (Spiegel), 618; (Hunt), 618
— — and Receptors (Boeke), 357
— Isometric Contraction (Hartree and Hill), 558
— Lactacidogen (Various authors), 483-4
— Lactic Acid and Rigor (Weber), 180
— — — and Work (Meyerhof), 556
— — — Formation (Embden and others), 483-4; (Parnas), 485; (Laquer), 487
— — — of Minced (Meyerhof), 245
— Latent Period (Steinhausen), 119
— Mammalian, Surviving (Riesser), 485
— Metabolism (Galeotti), 357
— Nicotine on (Lapique), 246
— of Copepods (Chatton), 302
— Osmotic Phenomena (Widmark and Lindahl), 486
— Oxygen Usage and Sympathetic (Nakamura), 316
— — Use (Adam), 432
— Plain and Striated (Carey), 482
— Power of (Reijs), 557
— Proteins of *Haliotis* (Takahashi), 558
— Red and White (Riesser), 485
— Relaxation (Bramson), 303
— Resistance (Hartree and Hill), 415
— Response (Sherrington), 358
— Rest Current and Excitability (Voelkel), 557
— Rigor Mortis (Mangold), 358; (Weber, Winterstein), 558
— Sarcoplasm Theory of Tone (Gutherz), 120
— Slow Contracting (Sheng and Schilf), 246
— Tone (Landauer), 120
— — and Creatine (Hammet), 120
— — in Insects (Buddenbrock), 115
— Tonic Contraction (Hoffmann), 486
— Tonus (Schaffer), 21; (Fröhlich and Meyer), 24; (Frank and others), 415; (Mourgue), 618; (Kahn), 618; (Spiegel), 618; (Hunt), 618
— — and Decerebrate Rigidity (Stewart), 22
— — and Sympathetic (Meyer), 22
— Veratrine Effect (Shüller and Athmer), 588
— Voluntary Contraction (Hill), 302
— Wave (Pond), 415
— Work (Almeida), 415
Muscles, Bird Wing (Magnan), 245
— Dynamometric Experiments on (Reys), 245
— Intercostal, Functions (v. Gelderen), 245
Muscular Contraction, Voluntary (Bass and Trendelenburg), 618
— — Work and Tension (Doi), 179
— Efficiency (Rancken), 416
— — Tests (Martin), 487
— Sense (Rappini), 308
— Work and Drugs (Scarborough), 278
— — Cost of (Waller and de Decker), 266; (Hill and Campbell), 266
— — Metabolism (Orr and Kinlock), 438
Mussels, Feeding of (Allen), 114
Mutarotation as Method (Murschhauser), 350
Mutation in Drosophila (Zeleny), 411
Mycorrhiza, Ectotropic (Rexhausen), 158
Myoglobin (Günther), 476
Mytilitol (Ackermann), 549
Mytilus edulis (Ackermann), 614
Myxœdema and Thyroid (Deusch), 69
Nails, Composition (Langecker), 352
Naphthalanine, Bacterial Action (Sasaki and Kinose), 645
Naphthylanine-β, Fate of (Engel), 439
Narcosis and Cerebral Blood Supply (Hoffmann), 79
— and Colloidal State (Traube and Klein), 452
— and Temperature (Issekutz), 644
— by Homologous Hydrocarbons (Fühner), 217
— Synergy in (Möhrke), 452
— Theory of (Meyer and Gottlieb-Billroth), 79
Narcotic Plants (Safford), 338
Narcotics, Action of (Fühner), 452; (Joachimoglu), 452
— and Nerve Refraction (Spiegel), 619
Nasal Cavities, Reactions (Mudd and others), 598
— Cavity Reactions (Mudd and others), 392
— — Vasomotor Reactions (Mudd and others), 221
Nephelometer (Kleinmann), 4
— Colorimeter (Kober and Klett), 350
Nephritis, Acid-Base Equilibrium in (MacNider), 196
— and High Protein Diet (Squier and Newburgh), 444
— and Reaction (Hara), 517
— and Residual N (Rosenberg), 144
— Blood in (Watanabe), 517
— ($HgCl_2$) and Phenolsulphonephthalein (MacNider), 152
— Hippuric Acid in (Kingsbury and Swanson), 204
Nereis Eggs, Effect of Rays on (Redfield and Bright), 298
Nerve, Ammonia Production (Tashiro), 181
— and Muscle Chronaxie (Banu and others), 558
— and Plasmodesma (Neal), 121
— Asphyxia and Osmosis (Gottschalk), 304
— Cell Development (Cajal), 247
— — Hyperplasia (Detwiler), 489
— — Staining (Bok), 237
— Cells, Galvanic Chromatolysis (Izawa), 249
— — Growth (Busacca), 301; (Ping), 361
— Chronaxie (Chauchard), 278; (Lapicque), 359; (Banu and Bourguignon), 359
— Circulation in (Torraca), 121
— CO_2 Production (Tashiro and Hendricks), 182
— Cord, Chemical Stimuli (Moore), 411
— — of Worm (Moore), 470
— — Regeneration (Hall), 242
— Development (Cajal), 247
— Effect of Chloral and Chloralose (Legendre), 305
— — of Cold (Schildwachter), 488
— — of Drugs on (Ozaki), 592
— — of $MgCl_2$ (Greisheimer and Shepard), 182
— — of Narcotics on (Chauchard), 278
— Eighth (Sachs and Alvis), 619
— Endings, Conductivity in Acids (Zotterman), 181
— Excitability in Man (Strohl), 609
— Facial, Chronaxie (Bourguignon and Tupa), 619
— Fasciculi (Riquier), 121
— Fibres and Terminations (Nageotte), 20
— Heat Block (Dawson and Ostlund), 181; (Ostlund and others), 559
— Impulse, Diversion of (Bickel), 23
— — Temperature Coefficient (Hill), 181
— NaCl Content of Vagus (Loeper and others), 247
— Oxygen Use (Adam), 432
— Peripheral Injuries (M.R.C. Rep.), 23
— Pflüger's Law (Sassa), 620
— Physical Properties (Spiegel), 619
— Regeneration (Henrickson), 304; (Hedinger), 559
— Resistance of Excited (Tedeschi), 247
— Section and Recovery (Couvreur), 359
— Specific Resistance (Broemser), 619
— Synapses in Sympathetic (Greving), 489
— Velocity and Temperature (Broemser), 121

Nerves, Esterase in (Ukai), 182
— Ventral, of Amphioxus (Ayers), 247
Nervous System, Growth in Fœtus (Dunn), 560
— — Physiology of (Horrax), 249
— — Release of Function (Head), 249
— — the Elementary (Walshe), 182
— — Vegetative, and Drugs (Friedberg), 218; (Isener), 218
Neuroglia Cells Development (de Castro), 20
Neurons, Growth of (Kappers), 418
Neurosis, Objective Study (Golla), 349
New-Born, Nutrition of (Schick), 62
Nicotine on Muscle (Lapique), 246
Nitrate and Tobacco Plant (Buckner and others), 287
Nitrates and Nitrites in Plants (Strowd), 338
Nitric Acid Reduction (Harrison), 172
— — — by Plants (Warburg), 159
Nitrification and Ions (Greaves), 338
Nitrites and Liver Volume (Edmunds), 591
Nitro-Bodies, Metabolism of (Sherwin and Hynes), 429
Nitrogen Assimilation (Dienes), 635
— Elimination (Pollock and McEllroy), 208; (McEllroy and Pollock), 267
— Estimation (Mestrezat and Janet), 381; (Stehle), 381; (Reyner), 548
— — by Kjeldahl and Folin (Hannaelt and Wodon), 239
— Fixation and Light (Kayser), 289
— — by Soy Beans (Fred), 602
— — in Beans (Whiting and others), 341
— Kjeldahl Method Improvements (Grigaut and Thiery), 237
— Micro-Method (Acél), 470
— Minimum Requirement (Thomas and Straczewski), 138
— of Rain Water (Wilson), 343
— of Serum (Hahn), 513
— of Soil (Lipman and Blair), 606
— Residual, Distribution (Becher), 221
— Utilisation by *B. subtilis* (Aubel), 288
Nitrogenous Equilibrium and Carbohydrate (Desgrez and Bierry), 58
— Metabolism and Adrenaline (Brel), 638
Nitrophenols, *m-* and *p-*, on Invertase (Rona and Bach), 391
Nitrous Oxide Anæsthesia (Dale and Hill), 451
Nobel Prize Award (T. G.), 45
Nodule Bacteria (Whiting and Hansen) 340; (Strowd), 340
" Norvalin " (Abderhalden and Kürten), 409
Novarsenobenzene Effects (Pomaret), 280
Novocaine, Effect on Muscle (Fulton), 483
Nuclear Metabolism and Histones (Clementi), 179
Nuclease in Fæces (Rother), 267
Nucleic Acid as Anticoagulant (Doyon), 626
— — Hydrolysis (Steudel and Peiser), 10
— — Metabolism (Underhill and others), 635
— — of Spleen (Steudel), 296
— — Thymus (Levene), 550
— Acids (Doyon), 237; (Levene), 475
— — Method (Feulgen), 10
— — of Spermatozoa (Steudel), 275
Nuclein Metabolism (Tannhauser and Schaber), 377; (Thannhauser and Ottenstein), 513
Nucleolus Functions (Gatenby), 19
Nucleoproteins and Cancer (Gröbly), 283
— of Cell (Gröbly), 243
— of Pancreas (Berkley), 11
Nucleus Activity (Tennen), 19
Nutrient Solution for Plants (McCall and Haag), 338; (Jones and Shrive), 340
Nutrition in School Children (Rich), 204
— in Vienna (Gribbon and Ferguson), 139
— Inadequate (Lusk), 635
— Index of (Wagner), 204
— of Plants (Reinau), 227
— of Potatoes (Johnston), 340
— State of (Hamburger and Jellenigg), 65
Nutritional Disorders (Hess), 107
Nystagmus (Ogata), 125
— and Equilibration (Brabant), 307

Oat Culture (Anon.), 340
Oats, Rust (Garber), 605
Odour and Residual Affinity (Durrans), 251
— Resonance Theory (Kodama), 251
Œdema and Stasis (Krogh and Harrop), 134
— Causation (Morawitz and Denecke) 314; (Hill), 314
— Experimental (Almeida), 430
— Fluid, Composition (Mayer and Morel), 627
— in Diabetes (Wilder and Beeler), 207
— Lymphatics in (Clark), 259
Œsophageal Heart Tracing (Fredericq), 569
Œsophagus, Auto-Digestion, P.M. (Pringle and Teacher), 52
— Movements (Prakken), 260
— Vagus Control (Carlson and Luckhardt), 504
Œstrus, Changes in Sow (Corner), 449
— Graafian Follicles in (Nielsen), 450
Oil, Fate of, in Peritoneum (Schwartze), 280
Oils, Essential, in Microscopy (Mayer), 5
— Hydrogenated, Digestibility (Holmes and Deuel), 56
— Various Animal (Tsujimoto), 474
Oleic Acid Hydrogenation (Feulgen), 474
Olfaction Theory (Heyninx), 364
Oligodynamy (Luger), 353; (Wernicke and Sordelli), 407
— Ag (Doerr), 219
— Metals (Falta and Richter-Quittner), 219
Onchidium, " Homing," etc. (Crozier), 16
Oögenesis (Gatenby), 301; Gelei, 616
Oophorectomy (Bailey), 450
Opacity of Liquids (Holker), 295
Ophthalmia in Avitaminosis (Wason), 201; (Osborne and Mendel), 201
Opium on Intestine (Uhlmann and Abelin), 82
Optones and Gas Exchange (Abderhalden and Brammertz), 149
— See Hormones
Orchids, Chemistry (Wester), 337
Organic Analyses by Bomb Calorimeter (Klein and Steuber), 403
Orientation Types (Bard), 360
Ornithuric Acid in Inanition (Suga), 205
Osmic Acid, Action on Plant Cells (Seeliger), 160
— — Reduction (Partington and Huntingford), 238
Osmosis and Plant Tissues (Harris), 231
— Anomalous (Loeb), 611
— in Alternating Field (Pelous), 7
— in Cells (Gray), 554
Osmotic Cell (Kolkowitz), 158
— Pressure and Donnan Equilibrium (Loeb), 295
— — of Body Fluids, Increase of (de Boer), 2
— — Regulation (Palmer and others), 404
Osteoclasts, Functions (Jordan), 21
Osteomalacia, Ovaries and Mineral Metabolism (Freund and Lockwood), 74
Osteophagia in Cattle (Green), 222
Otocysts in Gonionemus (Thomas), 420
Otolith Functions (de Kleijn and Magnus), 28; (Quix), 363, 562

Ova Development in Cat (Winiwarter), 328
Ovariotomy and Blood Sugar (Hürzeler), 515
Ovary and Uterus Correlation (Nielson), 384
— Extracts, Effects (Weil), 149
— Hormones of (Wintz), 149
— Internal Secretion (Freund and Lockwood), 74; (Ochoterena and Ramirez), 74
— Interstitial Cells (Fellner), 329
— in Undernutrition (Loeb), 641
— Rabbit (Salazar), 586
— Salmon (Greene), 586
— Tissue Cultures (Brugnatelli), 301
Ovulation (v. d. Hoeven), 385
— Physiology of (Loeb and Kuramitsu), 216; (Hartman), 216; (Brody), 216
Ovum, Internal Migration (Corner), 276
Oxalate, Plant (Plahl), 223
Oxalic Acid in Leaves (Bau), 599
— — in Plants (Patschovsky), 393
— — in Urine (Salkowski), 381
— — — and Fæces (Bau), 172
— — Metabolism of (Wegrzynomski), 67
Oxidase and Mn (Haar), 395
— and Salts (Rose and others), 96
Oxidases (Fernandez), 339
— in Monocytes (Schlenner), 117
— Intravitam Staining (Bétances), 300; (v. de Zande), 301
— Plant (Onslow), 287
Oxidation and Reduction (Abelous and Aloy), 352
— Beta (Spiro), 405
— Catalysis of (Karczag), 293
— Catalysts (Karczag), 410
Oxidations, Tissue (Dakin), 473; (Hopkins), 481
Oxycoumarins, Effects (Sieburg), 218
Oxydo-Reductions (Battelli and Stern), 535
— in Tissues (Lipschitz and Gottschalk), 589; (Lipschitz and Hertwig), 590
Oxyhæmoglobin Crystallisation (Dudley and Evans), 476
Oxygen and NaCl Toxicity (Starr), 115
— and Plankton (Müller), 163
— Bed Tent (Hill), 330
— Effect on Respiration and Circulation (Dauterbande and Haldane), 431
— Injections for Aviators (Bayeux), 631
— — in Dyspnœa (Bayeux), 315
— Lack (Schneider and Truesdell), 195
— — and Lactic Acid (Macleod), 196
— — and Respiratory Centre (Fraser and others), 196
— — at High Altitudes (Bayeux), 49
— — E.C.G. and B.P. in (Greene and Gilbert), 192
— — Effects (Doi), 316
— Pressure and Embryos (Riddle), 150
— Reaction of Flagellates (Fox), 176
— Supply in Lake Water (Cole), 176
— Therapy (Barach and Woodwell), 588
— Usage and Flagellates (Fox), 298
— — and Hæmorrhage (Schlomowitz and others), 195
— — and KCN (Galigher), 615
— — and Optones (Abderhalden and Brammertz), 149
— — Brain (Almeida), 503
— — Kidney (Tamura and Miwa), 144, 517
— — Larval (Parnas and Krasinska), 514
— — of Cancer (Waterman and Dirken), 528
— — of Intestine Cells (Freudenberg and György), 58; (Freudenberg and Mammele), 61
— — of Minced Muscle (Meyerhof), 245
— — Submaxillary (Miwa), 503
— — See also Tissue Respiration
Pacchionian Bodies (Clark), 32
Pain, Abdominal (Duke), 456
Pallidum (Vogt), 25
Palm Products (Brown and Merrill), 94
Pancreas, Amino-Acid Secretin (Arai), 506
— and Endocrines (Adler), 582
— Electric Variation (Anrep and Daly), 317
— Enzymes, Conservation (Fenger and Hull), 317
— Histology of (Chaves), 177
— Intrahepatic, of Fish (Ramalho), 178
— Islets and Glycosuria (Dubreuil and Anderodias), 143
— of Hedgehog (Chaves), 356
Pancreatic Extract, Effects (Paulesco), 442
Pancreatitis and Intestinal Juice (Binet and Brocq), 56
Papain, Enzymes of (Pozerski), 226
Papaïne Action (Pozerski), 112
Parabiosis (Matsuyama), 450, 451
Paraffin, Subcutaneous Injections (v. Gelderen), 244
Paraffins, etc., in Tissues (Fauré-Fremiet), 477
Paramœcium Conjugation (Hopkins), 551
Paranucleus of Pancreas (Chaves), 178
Parathyroid and C.N.S. (Hammett), 211, 271
— and Creatinine (Hammett), 583
— and Eclampsia (Massaglia), 326
— Hypofunction (Simpson), 211; (Massaglia), 211; (Hammett), 211
— Structure and Hyperplasia (Bergstrand), 272
Parathyroid (Boothby), 446
— and Paralysis Agitans (Koopmann), 447
— and Pituitary (Izumi), 148
— and Tetany (Farner and Klinger), 70
Parathyroidectomy (Hastings and Murray), 212
— Blood Reaction in (Ege and Henriques), 382
Parkinson's Disease (Marinesco and Rascanu), 416
Parotid Gland, Japanese (Ogana), 197
Paroxysmal Tachycardia (Feil and Gilder), 314; (Robinson and Herrmann), 314; (Wedd), 429
Parthenocarpy (Longo), 649
Parthenogenesis (Loeb), 214
— and Cytology (Cutler), 77
— Aster Stage (Chambers), 523
— in Water Vole (Sansom), 77
— of Bombyx Eggs (Lécaillon), 242
— of Frog Eggs (Hovasse), 276
— Plant (Böös), 232
Particles, Agglutination (Govaerts), 393
— Distribution of, in Circulation (Drinker and Shaw), 129; (Lund and others), 129
— Fate of Injected (Nagao), 367
Patellar Reflex (Castex), 470
Peach Tree Biology (Manaresi), 160
Pear Storage (Magness), 542
Peas, Nutritive Value (Johns and Finks), 199
Peat, Amino-Acids of (Miller and Robinson), 600
Pectin (Tutin), 459
Pectins (Clayson and others), 645
Pellagra (Lustig and Franchetti), 634
— and Diet (Wilson), 391
— in Hospital (Tanner and Echols), 265
— Urine and Saliva (Sullivan and Dawson), 197
— — in (Sullivan and others), 268; (Sullivan), 445
Pemphigus Menstrualis (Cramer), 392
Penis, Vasomotor Reactions (Crawford and George), 276
Pentose and Pentosan Estimation (Ling and Nanji), 473
— Utilisation (Rockwood and Khorozian), 200
Pentosuria (Justin-Mueller), 324
Pepsin Activity (Brewster), 171

Pepsin and Rennin, Effect of Temperature (König), 53
— Dynamics (Northrop), 551
— Estimation (Takata), 551
— in Urine (Nomura), 381
Peptone and Blood Bacteria (Delcourt-Bernard), 566
— Effect on Blood (Seeliger and Gorke), 566
— Injection in Septicæmia (Gow), 93
— Preparation (Soparkar), 612
Perfusion Fluid, Buffered (Barkan and others), 637
Perimeter (Hudson), 170
Peritoneal Cavity, Absorption from (Clark), 134; (Bolton), 630
— — Toxicity of (Weber), 328
Permeability (Hamburger), 547; (Schaeppi), 554
— and Rest Current (Vorschütz), 401
— of Cell Membranes (Jacobj), 82
Petrol, Effects of (Haggard), 151
— in Trypanosomiasis (Van Saceghem), 330
Phagocytosis (Calderone), 117
— after X Rays (Azzi), 480
— and Acids (Evans), 177
— and Narcotics (Torraca), 480
— Colloidal Au on (Nishida), 480
— in *Arbacia* (Kindred), 615
— in Tissues (Wislocki), 244
— Mechanism (Arric), 480
— of Carbon and Quartz (Fenn), 177, 300
Pharyngeal Gland of Worm (Keilin), 15
Phenolipoids (Piazza), 279
Phenolphthalein, Purgative Action (Willigen), 152
Phenols, Estimation in Urine (Weiss), 5
Phenylacetyl Amino-Acids, Fate (Sherwin and Shiple), 205
Phenylcinchoninic Acid and Uric Acid of Blood (Myers and others), 81
Phenylhydrazine Estimation (Ling and Nanji), 473
Phenyl-Hydroxybutyric Acid (Thierfelder and Schempp), 513
Phosphatase Phosphatese (Barendrecht), 353
— Plant (Nemec and Duchon), 533
Phosphate, Micro-Method (Embden), 471
Phosphates in Muscle (Embden and others), 484
— in Spasmophilia (Jeppsson), 283
— of Blood (Jones and Nye), 426
Phosphatides (Levene), 475
— Estimation (Brauns and MacLaughlin), 9
Phosphaturia and Nerve Disease (Dünner), 157
Phosphoric Acid Estimation in Serum (Wiener), 171
— — Metabolism (Blühdorn), 636
Phosphorus and Ca Excretion (Zucker), 517
— Metabolism and Fats (Telfer), 154
— of Blood (McKellips and others), 368
Photic Reactions of Tadpoles (Obreshkove), 402
Photodynamic Phenomena (Viale), 117; (Wetzner), 176
Photosensory Stimulation (Hecht), 16
Photosynthesis in Algæ (Wurmer and Duclaux), 289
— Marine Algæ (Moore and others), 99
Phototropism in Plants (Lundegårdh), 165; (Buder), 165
— Marine Animals (Goldsmith), 615
— of Leucoma (Manquat), 242
Phrenic Nerve Currents (Gasser and Newcomer), 488
Phrenosin, Fate of (Shimizu), 377
Physical Efficiency and Rest (Dawson and Wallrich), 169
— — Tests (Scott), 169
Physical Methods, Applications (Hill), 349
Physics and Biology (Hill), 235
Physiology, Aims (Fletcher), 401
— Annual Congress, Amsterdam, 1
— Congress, Paris, 1920 (L. Fredericq), 1
Phytase Action (Collatz and Bailey), 536
Picro-Carmine (Jensen), 172
Pigment Adaptation (Frisch), 325
— Cells in Anura (Kornfeld), 20
Pigmentation in Addison's Disease (Bittorf), 457
Pigments, Phototropic (v. Hess), 479
— Schizophyceæ (Boresch), 531
Pilocarpine Adrenalin Antagonism (Billigheimer), 82
— Atropine Antagonism (Leeuwen and Broeke), 454
— Effects (Bornstein and Vogel), 389
— Hyperglycæmia (Hornemann), 591
Pilomotor Reflex (André-Thomas), 248
Pineal and Pigmentation (Atwell), 213
— Body Functions (Zandrén), 521
— — Structure (Jordan), 585
Pines, Nutrition of (Ludwig), 228; (Siefert and Helbig), 228
Pinna Swelling in Scurvy (Sheashy), 140
Pipette, Automatic (Lorenz), 548
Pituitary, Abnormal (Holt), 585
— Adiposity (Himmelreich), 73
— and Diabetes Insipidus (Marañon), 274
— and Disease (Ascoli and Fagiuoli), 74
— and Diuresis (Pentimalli), 383; (Larson and others), 383; (Priestley), 581
— and Gastric Secretion (Hess and Gundlach), 148
— and Growth (Uhlenhuth), 72
— and Ovary (Fränkel and Geller), 383
— and Pancreas (Kraus), 640
— and Parathyroids (Izumi), 148
— and Polyuria (Camus and Roussy), 72; (Houssay and Hug), 521
— and Pregnancy (Gentili), 148
— and Thyroid (Herring), 72; (Berblinger), 640
— and Uterus (Athias), 327
— and Vessel Tone (Rosenow), 521
— Disorders (Cushing), 382
— Dwarf (Priesel), 640
— Effects in Man (Silva), 72
— Extact in Midwifery (Rucker and Haskell), 327
— — Variable Action (Parisot and Mathieu), 73
— Feeding (Smith and Cheney), 447
— Functions (Various authors), 447
— Hypo-Function (Kay), 327
— in Diabetes (Kraus), 143
— in Pregnancy (Gentili), 327
— in Woodchuck (Rasmussen), 148
— Oral Administration (Hamill), 327
— Principles (Dale and Dudley), 584; (Roca), 585
— Standardisation (Kochmann), 521
— Tumours in Animals (Vermeulen), 274
Pituitrin and Gastric Secretion (Hoffmann), 212
— as Diuretic (Stoland and Korb), 213
— in Labour (Ryder), 447
Placenta, Absorption of Particles by (Wislocki), 215
— Biology of (Piccoli), 150
— Iron Content (Wagner), 215
— Permeability of (Edelstein and Jippö), 78; (Wislocki), 277
— Separation of (Frankl), 276
— Structure (Fujimura), 585
Placental and Fœtal Hormones (Verdozzi and Cavalieri), 385
Plain Muscle and Radio-Activity (Soref), 180
— — and Tissue Extracts (Backmann), 455

Plain Muscle Bladder, Tonus (Roskam), 62
— — Duodenum of Rat (Hammett), 198
— — Frog (Viale), 487
— — Heat Paralysis (Evans), 118
— — in Skin (Slawik), 119
— — Leech Preparation (Teschendorf), 610
— — of Intestine (Carey), 261
— — Rigor (Mangold), 359
— — — — and Composition (Hirsch), 22
— — Stomach (Tezner and Turolt), 504
Plant Chemistry (Various), 394, 396
— Colloids (Samec and others), 337
— Cultures (Davis), 340
— Dermatitis (Sprague), 599
Plants, Drought-Resisting (Bhide), 343
— Drugs on (Ciamician and Ravenna), 336
— Enzymes (Various), 395
— Growth (Various), 395, 396, 398
— — and Illumination (Garner and Allard), 342
— Infections (Thomas), 104
— New Habitats (MacDougal), 605
— Pathology (Various), 346, 398, 464, 465
— Sap Conductivity (Harris and Valentine), 604
— Teratology (Lo Priore), 538
— Tissue Fluids (Harris and others), 158
— Tissues, Osmosis in (Harris and others). 341; (Rudolfs) 342
— Water Relations (Waller, Blackman), 461
Plasma Bicarbonate in Anaphylaxis (Eggstein), 455, 456
— Cells (Meiroisky), 617
Plasmodesma (Neal), 121
Plasmolysis and Electro-Osmosis (Collander), 110
Platelets, Counting Method (Buckman and Hallisey), 129; (van Herwerden), 170
— Formation (Bunting), 36
— Functions (Govaerts), 129, 566; (Roskam), 367, 566
— in Immunity, etc. (Degkwitz), 35
— Saponin on (Firket), 589
Pneumonia, Met-Hb in (Stadie), 284
Pneumonic Exudate (Lord and Nye), 456
Poison Gas, German (Flury and others), 281
— Gases (Mayer and others), 154
Poisons, Plant (Wöber), 233
Polar Excitation, Artery (Liebermann), 629
Polarity, Organic, and Currents (Lund), 552
Pollination in *Escallonia* (Cummins), 232
— of Fruit (Rawes), 462
Polygraph Sphygmomanometer (Söler), 350
Polypeptide Configuration (Abderhalden and Handovsky), 409
Polysaccharide, Bacterial Destruction (Epstein), 226
Polysaccharides (Samec), 173; (Karrer and others), 238
— Digestion (Shimizu), 374
Polyuria and Pituitary (Camus and Roussy), 72
Pons, Sensory Lesions (Bergmark), 560
Porphyrin Fluorescence (Langecker), 381
Portal Infusions (Yamada), 502
— Vein Obstruction (Kaspar), 55
Posture and Hypertonus (Hunt), 618
— on Circulation (Ellis), 258
Potassium Adsorption (Mitchell and Wilson), 487
— — by Cells (Mitchell and others), 616
— and Na in Blood (Blum and others), 425
— and Radio-Activity (Zondek), 500
— and U-Ions on Heart (Jannink and Feenstra). (Zwaardemaker), 428
— Estimation (Tisdall and Kramer), 548
— — in Serum (Kramer and Tisdall), 237
Potassium Radioactivity and Heart (Zwaardemaker), 312
Potato and Potato Flour (Mangels), 579
— Diseases (Fulmek, Stift), 233
— Fertilisers for (Hoffmann), 602
— Freezing Point (Wright and Harvey), 532
— Inflorescence (G. C. G.), 601
— Mosaic Disease (Cotton), 607
— Rot (Edson and Shapovalov), 544; (Schaffnit), 544
Potatoes, Nutrition of (Kraft), 161
Precipitins and Immunity (Mackenzie and Leake), 283
Pregnancy, Blood in (Mahnert, Watrin), 385
— — Volume (Mahnert), 215
— NH_3 Coefficient in (Cullis and Hewer), 79
— Reaction (Watrin), 393
— Uric Acid in (Williams), 282
— Vomiting of (Harding), 450
— X-Ray Diagnosis (Bartholomew and others), 215
Prenatal Death (Robinson), 169
Priapulus, Physiology of (Hammarsten and Runnström), 115
Primrose Pollination (Dallman), 649
Pronephros of Amblystoma (Howland), 143
Prostate and Behaviour (Macht and Bloom), 127
— Studies (Macht), 213
Protamines and Histones, Significance (Clementi), 20
— Separation from Alkaloids (Jonescu), 112
Proteases (Nagagawa), 477
Protein, Amino-Groups (Engeland), 475; (Edlbacher), 475
— Analysis, Van Slyke Method (Menaul), 239
— Cleavage Products, Action (Pfeiffer), 153
— Cooking and Digestibility (Waterman and Johns), 199
— Crystalloids (Solla), 228
— Diet after Fasting (McCann), 66
— Effects of Derivatives (Underhill and others), 635
— Electrolyte Action (Szent-Györgyi), 12
— Feeding and Milk Secretion (Hartwell), 318
— Heat Coagulation and P_H (Okuda and Zoller), 612
— in Nutrition (Plimmer), 199
— Intoxications (Pentimalli), 595
— Metabolism and Heat Regulation (Freund), 69
— — and Polysaccharides (Shimizu), 377
— — Cysteïne (Kapfhammer), 612
— — in Child (Ruotsalainen), 438
— N Methyl Groups (Herzig), 613
— Nutritive Values (McCollum and others), 374
— Quality and Nutrition (Plimmer), 374
— Racemisation (Woodman), 296
— Structure (Loew), 110
— Sulphonation Indices (Edlbacher), 239
Proteins, Basic (Felix), 475
— Bean (Johns and Finks), 262
— Colloidal Behaviour (Loeb), 174
— Effect of Ions on (Loeb), 7
— Free Amino-Groups of (Edlbacher), 9
— Iodised (Blum and Strauss, Strauss and Grutzner), 10
— Iso-Electric Point Apparatus (Szent-Györgyi), 7
— Physico-Chemical (Loeb), 472, 473
— — Characters (Cohn), 173
— Purification (Field), 239
— Pyrrol Structure of (Troensgaard), 10
— Tomato Seed (Johns and Finks), 285
Proteinuria, Postural (Harrison), 598
Proteolytic Activity Method (Brewster), 171

Proteoses, Racemised (Langecker), 351
Protoplasm " Activation " (Frisch and Starlinger), 481
— Circulation and Temperature (Meyer), 158
— Composition of Plant (Walter), 644
— Movement (Loeb), 481
— Plant, Permeability (Kahho), 647
Protozoa Cultures, H· (Bodine), 410
— Death Temperatures (Boeck), 551
Pruning (Corbett), 232; (Magness and others), 288
Pseudoanoxybiosis (Lipschitz and Hertwig), 590
Psychogalvanic Phenomenon (Georgi), 305
— Reflex (Grünbaum), 30; (Einthoven and Roos), 364; (Roos), 421
— — and Malingering (v. Iterson), 563
— — in Frog (Fauville), 127
Psychological Apparatus (Wells and Kelley), 31
— Reactions (Perrin and others), 421
— Tests for Aviators (Stratton and others), 185
Psychology in Hospital Teaching (Calwell), 251
— in Medicine (Jacobson), 421
— of Monkey (Buytendijk), 30
Ptyalin and Starch (Maestrini), 408
Pulmonary Circulation (Wiggers), 260; (Bainbridge and Underhill), 315; (Underhill), 570
— — and Vasodilatation (Abe), 194
Pulse and B.P., Effect of Posture (Ellis), 258
— Differential (Pech and Quinquaud), 429
— in Aortic Disease (Feil and Gilder), 314
— Œsophageal (Meldolesi), 504; (Fredericq), 569
— Rate, Effect of Rhythm on (Reys), 258
— Velocity (Weitz and Hartmann), 629
— Wave Velocity (Lundsgaard and Beyerholm), 350
Pupil and Sympathetic (Joseph), 184
— Argyll-Robertson (Wilson), 490
— Mechanism (Werkamp), 306
— Paradoxical Dilatation (Byrne), 249
— Reaction Apparatus (Fackenheim), 236
Pupillary Reflex, Loss of (Garvie), 621
Purgatives (Daels), 388
— Action of (Willigen), 152
Purine Metabolism (Dresel and Ullmann), 516; (Rose), 635
— — Intermediary (Thannhauser and Czoniczer), 334
Purines in Cells (Bauer), 553
Pursuitmeter (Miles), 563
Pyloric Secretion (Ivy and Oyama), 432
Pylorus Movements (Wheelon and Thomas), 53
— Obstruction and Blood (Hastings and others), 197
Pyocyanin (Cluzet and others), 477
Pyrimidine Metabolism (Wilson), 67
— Sulphur Derivatives (Freise), 67
Pyrrol, Fate of (Shimizu), 377
Pyrryl Methane Dyes (Fischer and Luckmann), 350
Pyruvic Acid and Moulds (Nagayama), 533
— — in Fermentation (v. Grab), 613; (Kerb and Zeckendorf), 646; (Grab), 646

Quellung. See Swelling
Quinidine Effects (Arrillaga and others), 524, 525; (Cohn and Levy), 524
— in Auricular Fibrillation (Arrillaga and Waldorp), 389
— in Fibrillation (Drury and others), 498
— in Heart Disease (Jenny), 279
— on Heart (Baden and Neukirch), 429
Quinine Action on Bloodvessels (Latzel), 81
— — on Uterus (Acton), 81
— — on Yeast (Schulz), 81
Quinine Adrenaline Antagonism (Clerc and Pezzi), 82
— Alkaloids in Tissues (Schnabel), 591
— Effects (Siperstein and Litman), 279
— Distribution in Blood (Rona and Bloch), 524
— Hæmolysis (Brahmachari and Sen), 524
— in Blood (Acton and King), 279
— on Enzymes (Rona and others), 391
Quinoleine on Heart (Fredericq and Terroine), 331
Quinones as Bactericides (Morgan), 648
Quinotoxin and Quinine (Sollmann), 218
Quitenine and Quinotenine (Dauber), 81

Radiations, Biological Action (Russ), 609
Radioactivity and Heart (Zwaardemaker), 258
— and Hormones (Zwaardemaker), 628
— and Life (Demoor), 235
— and Plain Muscle (Soref), 180
Radiopuncture of Cells (Tchahotine), 355
Radium, Action of Embryos (Gudernatsch and Bagg), 79
— — on Nereis Eggs (Redfield and Bright), 298
— — on Spermatozoa (Alverdes), 76
— — on Uterus (Nürnberger), 80
— Dosage (Seitz and Wintz), 80
— Effects of (Hanenstein), 386
Raffinase and Saccharase (Willstätter and Kuhn), 353
Raphides (Brunswik), 95
Rations, High Protein, for Cows (Ellet and Holdaway), 57
Reaction, Colorimetric Determination of (Felton), 237; (Michaelis), 237. See also Hydrogen Ion
Reciprocal Innervation (Pfahl), 358; (Dorello), 559
Recovery Process (Adrian), 413
Red Cells, Acid Load of (Haggard and Henderson), 46
— — and Ultraviolet (v. Rohden), 33
— — as Antigens (Chodat), 566
— — Autolysis (Morse), 186
— — Basophile Granules (Kreibich), 554
— — Ca Content (Richter-Quittner), 254
— — Composition (Falta and Richter-Quittner), 255
— — Distribution in Stream (Bostrom), 624
— — Effect of Digitalis, etc. (Straub and Meier), 46
— — — of $KMnO_4$ (Sabbatani), 494
— — Electric Charge (Kosaka and Seki), 255, 493
— — Enumeration (Feucht), 109
— — Eosin Light Hæmolysis (Pfeiffer and Bayer), 423
— — Form of (Wyss), 366
— — Fragility (Greenthal and O'Donnell), 625
— — Hæmatophagy (Woodcock), 616
— — Hæmolysis (Hattori), 423
— — — by $CHCl_3$, etc. (Apitz and Kochmann), 33
— — — by Dyes (Jodlbauer and Haffner), 423
— — Impermeable to Glucose (v. Creveld and Brinkman), 441
— — Measurement (Bergansius), 565
— — Optical Measurement (Bergansius), 494
— — Osmotic Fragility (Spanje), 254
— — — Pressure (Ege), 186
— — Permeability (Schaeppi), 554; (Wiechmann), 565
— — — Amino-Acids (Kozawa and Miyamoto), 624
— — — of to Anions (Wiechmann), 366
— — — to Peptone, etc. (Abderhalden and Kürten), 423
— — " Refusion " (Penfold), 253
— — Resistance (Neilson and Wheelon), 309
— — — to Osmosis (Brinkman; Neilson and Wheelon), 422

Red Cells, Respiration (Ellinger), 624
— — Sedimentation (Abderhalden), 423
— — Size of (Price-Jones), 366
— — Structure (Demel), 494; (Key), 616
— — — and Hæmolysis (Bechhold), 34; (Sálen), 34
— — Sugar and Cl (Bönninger), 580
— — — Permeability (Ege), 206; (Bürger), 206
— — Survival of (Sogen), 187
— — Suspension, Viscosity of (Hatschek), 33
— — Volume and Osmosis (Takei), 624
— — Water Intake (Takei), 186
Reduced Pressure, Effect of, on Blood (Sundstroem and Bloor), 38
Reduction, Methylene Blue (Schulmann and Justin-Besançon), 547
— of Methylene Blue (Bayeux), 243
— of Nitro-Bodies (Lipschitz and Gottschalk), 589; (Lipschitz and Hertwig), 590
Reflex Arcs for Feeding (Shaklee), 123
— Babinski (Walshe), 24
— Clasp in Frog (Kahn), 618; (Spiegel), 618
— Crossed Extension (Forbes), 359
— Duration of (Plattner), 489
— Flexor (Sassa and Sherrington), 24
— Inhibition and Excitation (Whitaker and Forbes), 181
— Patellar (Bremer), 21; (Castex), 470
— — Reinforcement (Popper), 23
— Pilomotor (André-Thomas), 248
— Plantar (Almeida), 417
— Proprioceptive (Sassa), 619
— Response in Frog (Sassa), 620
— Time and Stimulus (Kauffmann and Steinhausen), 489
— Times in Frog (Jolly), 23
— Wipe, of Frog (Wachholder), 305
Reflexes, Frog Embryo (Wintrebert), 248
— in Fish (Schiche), 306
— in Frog (Almeida), 417
— of Starfish (Mangold), 354
— Protective (Amsler), 493
— Tendon, Dual Type (Piéron), 248
— Tonic, and Eye Muscles (Kleijn), 417
— — and Rhythmic (Eichholtz), 417
— Types (Salomonson), 182
— Visceral (Ranson), 620
— — Skeletal (Carlson and Luckhardt), 248
Refractometer (Smart and Hocking), 294
Regeneration and CO_2 in Planaria (Robbins and Child), 15
— in Planaria (Vandel), 242
— of Nerve in Annelid (Hall), 242
Reissner's Fibre (Kolmer), 491
Rejuvenation Experiments (Mendel), 585
Release of Function (Head), 249
Renal Efficiency (Comrie), 637
— Function Test (Kingsbury and Swanson), 444
Rennet in Fœtus (Porcher and others), 318
Rennin and Pepsin (Edie), 478
— Duodenal (Leist), 506
Repercussion, Reflex (Bourguignon), 488
Reproduction and Diet (Pearl and Fairchild), 328
— in Birds (Riddle and others), 522
— in Fowl (Pearl and Schoppe), 385
— Sexual and Asexual (Malaquin), 77
Reproductive Organs in Parabioses (Yatsu), 276
Residual and Reserve Air (Geigel), 259
Resistance, Electrical, of Cells (Philippson), 18
— to Poisons (Drzewina and Bohn), 243
Respiration, Adrenaline on (Roberts), 584
— and Blood C_H (Fleisch), 503
— and CO_2 Output in Anæsthesia (Heymans), 371
— and Heart (Pearce), 136
— and Kidneys (Haldane), 107
— Effect of CO_2 on (Uzhofer), 47
— in Cardiac Dyspnœa (Barr and Peters), 48
— in Wind (Senner), 502
— Intracellular, KCN on (Lund), 479
— Mouth Piece (Moore), 236
— of Infants (Eckstein and Rominger), 194; (Pacchioni), 572
— of Roots (Cerighelli), 290
— Periodic and O_2 (Macleod), 196
— Plant (Brooks, Maquenne and Demoussy), 461
— — and Osmosis (Inman), 604
— Plants (Brooks), 541
— Ratios (Burtt), 548
— Theory (Warburg), 412
— Thoracic (Lane), 630
— Vital Capacity (Peabody and Sturgis), 630
Respiratory Apparatus (Rolly), 195; (McCaskey), 203
— Centre, Action of Lobeline (Eckstein and others), 279
— — Activity and Blood Flow (Hastings and others), 502
— — and Decerebration (Macleod), 46
— — and Oxygen Lack (Fraser and others), 196
— — in Anæsthesia (Trevan and Boock), 136
— Efficiency (Flack), 430
— Exchange, Effect of Anions (Bing), 204
— — in New Born (Plant), 315
— — Methods (Bailey, Newcomer), 403
— Quotient (Weiss), 503
— — in Hibernation (Hari), 206
— — Uncertainty (Fries), 135
— Waistcoat (McSwiney), 136
Rest and Efficiency (Wallrich and Dawson), 401
Restiform Body Nucleus (Hirose), 249, 560
Retina Model (Weigert), 492
— Sedimentation of Blood in (Elschnig), 35
Retinal Artery Pressure (Duverger and others), 124
— Colour Changes (Nakamura), 307
— Reflex after Benzene (Cameron and Sedziak), 184
Rhizomes of Bracken (Henrick), 394
Rhubarb Leaves (Mane), 199
Ribohexosaminic Acids (*d*) (Levene and Clark), 173
Rice Flower and Fruit (Yamaguchi), 165, 166
— Seed, Helminthosporiose (Nisikado and Miyake), 607
Rickets (Zilva and others), 435-7; (Various authors), 509-10; (Findlay and others), 512; (Stoeltzner, McCollum and others, Park and Howland, Hodgson), 576-7
— and Adrenaline (Lehnerdt and Weinberg), 584
— and Diet (Hess and Unger), 57; (Findlay), 264
— and Ultraviolet Light (Lasch), 579
— and Vitamins (Mackay), 56
— Cod-Liver Oil and P (Stoeltzner), 219; (Phemister and others), 219
— Etiology (Paton), 201; (Strongman and Bowditch), 264
— in Rats (Sherman and Pappenheimer), 319; (Shipley and others), 319
Ripening of Fruit (Overholser and Taylor), 101
— Tomato (Sands), 101
Roe of Fish (McCrudden), 587
Root Excretion (Greisenegger), 100
— Oxidation by (Borkowski), 100
Roots and Soil Composition (Tacke), 103

Roots Chlorophyll in (Siebert), 227
— Effect of CO_2 on (Noyes and Weghorst), 103
Rotation Effect on Dogs (Pozerski), 563
Rumination in Infants (Somersalo), 136

Saccharase (Euler and Svanberg), 339; (Salkowski), 339
— and Raffinase (Willstätter and Kuhn), 353
— Intestinal (Euler and Svanberg), 353; (Euler and Myrbäck), 353
— Light and Oxidation (Svanberg), 408
— P Content (Euler and Svanberg), 112
— Purification (Svanberg), 13
Sacral Sympathetic (Johnson), 121
Sagittal Organ (Kolmer), 491
Salicinase, Heat on (Bertrand and Compton), 535
Salicylate, Intravenous (Lutembacher), 330
Salicylates and Blood P_H (Hanzlik), 525
— and Free Acid (Hanzlik), 388
— Guaiacol, etc., Storage in Tissues (Jurgens), 83
Salicylic Acid Fate (Dervient), 439; (Angelico), 439
Saligenin Hg Derivative (Hirschfelder and others), 389
Saligenins, Substituted (Quigley and Hirschfelder), 387
Saliva, Action of Ash on Starch (Bachrach), 113
— Activity of (Sanctis-Monaldi), 432
— Composition (Clogne and Richaud), 260
— Reaction (D'Alise), 503
— Reflex after Decapsulation (Gley and Quinquaud), 260
— Sulphocyanate in Pellagra (Sullivan and Dawson), 197
— Thiocyanate in (Reissner), 631
Salivary Gland Metabolism (Miwa), 503
— Glands, N Metabolism (Anrep), 197
— — Pilocarpine Action (Barbour and Freedman), 52
— — Stimulation of Excised (Quagliariello), 52
— Secretion (Scheunert and Trautmann), 573
— — and Pilocarpine (Barbour and Freedman), 573
Salmon Tissues, Carbohydrate in (Greene), 641
Salt Action and H-Ions (Falk), 92
— Antagonism in Eggs (Lillie), 412
— —in Shrimps (Martin and Wilbur), 176
— Exchange Centres (Veil), 63
— Metabolism (Forbes and others), 511; (Stransky), 512
Saltbush Analysis (Guthrie), 224
Salted Meat and Fish (Schmidt-Nielsen), 507
Salting Out and Isoelectric Point (Labes), 110
Salts and Colloids in Neoplasms (Scala), 173
— and Permeability (Haynes), 413
— and Plant Tissues (Kahho), 537
— Assimilation (Weitzel), 244
— Effects on Water Retention (Lasch), 280
— Sea Water (McClendon), 199
Santonin, New Source (Greenish and Pearson), 223
Sap, Osmotic Pressure (Harris), 541
Saponine Effect on Platelets (Firket), 589
Sarcoma, Digestion of (Danchakoff), 599
— Experimental (Paine and Peyron), 20
Schizophyceæ Pigments (Boresch), 531
Scopolamine Intoxication (Alexander), 333
Scurvy (Zilva and others), 436-7
— and Dried Fruit Juice (McClendon and others), 203
— — Cabbage (Holst and Frolich), 203
— and Milk (Anderson and others), 578
— and Swelling of Pinna (Sheasby), 140
— Infantile (Segawa), 203
Seasons, Effect on Plants (Schroeder), 161
Sea Water and Textiles (Dorée), 95
— — Salts (McClendon), 199
Secalopan (Uhlmann), 218
Second Wind (MacKeith and others), 316; (Chailley-Bert and others), 372
— — Circulation in (Pearce), 197
Secretin from Amino-Acids (Arai), 506
— Heat (Bickel and v. Eweyk), 317
— in Anæmia (Downs and Eddy), 634
Sedatives, Estimation of Effects (v. Leeuwen), 278
Sedimentation of Red Corpuscles (Elschnig), 35; (Linzenmeier), 35; (Abderhalden,) 78
Seed, Dormancy of Timothy (Fisher), 97
— Germination (Salter and others), 460
— Soaking (Braun), 463
— Waste (Shrader and Rabak), 394
Seedlings, Starvation of (Coupin), 291
Seeds, Arctic (Porsild), 532
— as Food (Finks and Johns), 434
— Moisture Intake (Shull), 97
Segmentation Capsule (Frank), 609
Selenium, Effect of, on Fungi (Němec and Káš), 229
Semen, Horse (Yamane), 640
— Serum Tests (Dervieux), 328
Semicircular Canals and Labyrinth Tone (Retjö), 125
— — Endolymph Movement (Maier and Lion), 125
— — Functions (Tullio), 125
Seminal Vesicles (Wertheimer and Dubois), 449
Semipermeable Cuticle in *Sipuncula* (Dekhuysen), 15
Sensation (Piéron), 363
— and Environment (Fredericq), 563
— and Sympathetic (Tournay), 618
— Nature of (Ohrwall), 492
Sensations in Disease (Herring), 491
Sense Organs of Turtle (Honigmann), 562
— Physiology, Subjective (Tschermak), 251
Sensory Fibres of Anterior Root (Lehmann), 121
— Response, Dogfish (Maxwell), 470, 490
Serum, Auxoreatic Function (Jacoby), 253
— Bromide in (Merke), 253
— Complement Destructor (Mandelbaum), 156
— Desensitisation (Mackenzie), 392
— Disease and Precipitins (Mackenzie and Leake), 283
— Injection Effects (Dustin), 302
— Precipitation by Metals (Hess and Reitler), 609
— Protein Removal (Piettre and Vila), 610
— Proteolytic Enzyme (Stephan and Wohl), 551
— Residual N (Hahn), 513
— Sickness, New (Forrsmann), 90
— Sugar of (Rusznyák and Heténi), 516
— Tests, Blood and Semen (Dervieux), 328
Sex Characters (Halban), 523
— — and Castration (Lipschütz), 522
— — Secondary (Pézard), 76; (Aron, Courrier, Portier and Rorthays), 449
— Determination (Sailer), 18; (Goldschmidt), 450; (Bluhm), 522
— — in Frogs (Goldschmidt), 19
— Differences in Discussion (Burtt), 31
— Hormones (Halban), 449; (Fiebiger and others), 449
— Linked Lethal Factors (Little and Gibbons), 150
— Metabolic Theory (Riddle), 150
— Mutation (Champy), 328
— Phenomena, Reversive (Draper), 276
Sexual Organs and Characters (Sand), 522
Shaking Device (Baumberger), 4
Shock and Lactic Acid (Macleod), 196
— Colloid (Brusselmans), 594

Shock " Colloidoclasic " (Widal and others), 455
— Nature (Crile), 89
— Peptone (Garrelon and Santenoise), 643; (Gautrelet), 643
Sulpharsenol (Tzanck), 594
— Traumatic, and Metabolism (Aub and others), 87
Silage (Dox and Yoder), 460
— Sunflower (Neidig and others), 507
Silicic Acid Elimination (Zuckmayer), 209
Silk, Amino-Acids of (Inouye and others), 10
Silkworm Eggs (Tomita), 474
— — Effect of Cold and Electricity (Grandori), 300
— — Parthenogenesis (Lécaillon), 242
— Enzymes and Blood (Kawase and others), 242
Sino-Auricular Node, Removal (Eyster and Meek), 192
— — Temperature on (Schlomovitz), 257
Sinoventricular Bundle (De Cady), 312
Skatole Toxicity (Salant and Kleitman), 455
Skeleton, Dynamics of Growth (Carey), 179
Skin Absorption (Latzel and Stejskal), 555
— Galvanic Reaction (Ebbecke), 482
— of Toad, Adrenaline on (Wastl), 638
— Pigment (Todd and Van Gorder), 414
— — Transport (Meyer), 556
— Regeneration (Frieboes), 325
— Salt Permeability (Parnas), 210
— Toad's, and Sympathetic (Brücke), 619
— Urticarial Reactions (Mackenzie and Baldwin), 457
Slides, Staining and Drying (Lamb), 6
Smell, and Chemical Structure (Tschirch), 492
— in Dog (Buytendijk), 492
— Return of Lost Sense (Hofmann), 126
— Sense of (Zwaardemaker), 420
— Theory of (Durrans), 251
Smoke Pollution and Plants (Ruston), 168
Smoking and Efficiency (Froeberg), 30
Snake Venoms, Absorption (Houssay), 527
Snow and Vegetation (Davis), 342
Sodium and K in Blood (Blum and others), 425
— Effect of, on Heart (Zondek), 499
— Estimation (Doisy and Bell), 40; (Tisdall and Kramer), 548
— — in Serum (Kramer and Tisdall), 311
— in Cells (Funcoka), 553
Soil Acidity (Various), 543; (Osugi, Hasenbaümer), 606
— — and Ericaceæ (Wherry), 103
— — and Sulphur (Martin), 291
— Analyses, Indiana (Carr and Phares), 103
— and Plant Disease (Howard), 168
— Bacteria and Gypsum (Singh), 291
— — Growth of (Noyes and Grounds), 104
— — in Frozen (Noyes), 104
— Carbon Determination (Read), 600
— Chemistry (Various), 343-346, 398
— Colloids in (Moore and others), 600
— Effect of Salts (Wolkoff), 291
— Inoculation of (Ehrenberg), 104
— Nitrification (Noriega), 543
— Phosphates (Bauer), 606
— Physiology (Various), 464
— Reaction (Bondorff), 167; (Wherry), 167; (Olsen), 605
— Vapour Pressure (Thomas), 606
— Water of (Livingston and Koketsu), 291
Sound, Effect on Reflexes (Bruyn and v. Nifterik), 492
— Localisation (Kreidl and Gatscher), 28
— Perception (Aggazzotti), 420
— Protection against (Marage), 621
Sowing, Depth of (Harris and Maughan), 288
Soy-Bean Flour, Value (Johns and Finks), 199
Soya-Bean Culture (Wester) 646
Space, Sensation of (v. Frey), 493
Sparteine Effects (Chistoni), 525
Spasmophilia (Eckstein), 416
Speech Disorders (Blanton), 456
Sperm Stimulant (Clowes and Bachman), 214
— — of Egg (Clowes and Bachman), 115
Spermatic Cord Ligation (Levy-Lenz and Schmidt), 275; (Loewy and others), 276
— Fluid of Horse (Yamane), 275
Spermatogenesis (Dehorne), 149
— and Alcohol (Kostitch), 278
— of *Lepisma* (Charlton), 176
— Opossum (Painter), 640
— Reptilian (Painter), 585
Spermatozoa, Effect of Radium (Alverder), 76
— Nutrition of (Benoit), 328
— of Pangolin (Anthony and Champny), 275
— Physiology (Gellhorn), 149
— Sterilisation by Injection of (Dittler), 77
— Survival (Wolf), 448
Sphygmograms (Harlé), 132
Sphygmograph, Hot Wire (Hill), 132
Spiders, Instinct (Rabaud), 15
Spinage and Sea Salts (McClendon and Sedgwick), 199
Spinal Cat, Blood-Pressure in (Yates), 500
— Cord and Drugs (Santesson), 454
— — Degeneration (Spatz), 135
— — Hyperplasia (Detwiler), 560
— — Myelination (Kaufman), 418
— — Surviving (Sereni), 620
— Ganglion Hypertrophy (Terni), 619
— Preparation, H_2O_2 for (Sereni), 560
— Reactions in Cat (Prewitt), 491
Spirilla Movements (Metzner), 231
Spirochætosis in Rabbit (Levaditi, Marie and Isaïca), 33
Splanchnic and Blood-Pressure (Gley and Quinquaud), 630
Spleen and Blood-Corpuscles (Howard and Soler), 33
— and Red Corpuscles (Frey), 33
— and Thymus (Baggio), 629
— in Acidosis (Householder), 387
— Internal Secretion (Eddy), 448
— Leucocytes produced by (Melczer), 32
— Marrow and Thymus (Asher and Matsuno), 639
— Removal and Liver (Silvestrini), 55
Sprue, Meat Diet in (Conran), 90
— Pancreatic Juice in (Brown), 283
Squill, Rat Susceptibility (Gunn and Heathcote), 218
Standing, Static Control (Miles), 185
Starch (Reychler), 533
— Chemical (Karrer and Nägeli), 238
— Digestion of (Pastore), 317
— Effect of Cl' and SO_4'' (Courtonne), 8
— Estimation by $KMnO_4$ (Quisumbing), 5
— — Polarimetric (Lühig), 238
— Grains (Samec and Mayer), 531
— — Polarisation (Gillis), 351
— — Swelling of (Courtonne), 285
— Iodide (Lottermoser), 474
— of Algæ (Mangenot), 532
— Solubilisation by Moulds (Boas-Weihenstephan), 225
— Soluble, in Plant Metabolism (Boas), 161
Starfish Chemistry (Hinard and Fillon), 614
— Tropisms (Moore), 614

Starvation Effect on Endocrines (Vincent and Hollenberg), 212
— Gastric Juice in (Sutherland), 261
— in Vienna (Dalzell and others), 508; (Gribbon and others), 511
— Physiology of (Tigerstedt), 263
Statocysts of Wheat (Prankerd), 101
Statoliths and Geotropism (Guttenberg), 101
Steinach's Operation (Levy-Lenz and Schmidt), 275; (Loewy and others), 276
Stem Curvature (Fyson and Venkataraman), 98
Stereoscopic Effects (Hankin and Hartridge), 184
Stereotropism of Dogfish (Maxwell), 470, 490
Sterility and Diet (Reynolds and Macomber), 437
— and Hormones (Haberlandt), 640
Stomach after Vagotomy (Borchers), 573
— Atropine on (Hecht), 454
— Cardia, X-Ray Study (Palugyay), 197
— Effect of Vagotomy (Litthauer), 137
— Evolution of (Lameere), 574
— Interdigestive Phase (Rehfuss and Hawk), 136
— Lactic Acid in (Pittarelli), 137
— Morphine on (Jarno and Marke), 590
— Motility in *Necturus* (Patterson), 198
— — in Turtle (Bercovitz and Rogers), 198
— Movement and Bile (Pannett and Wilson), 198
— — and Innervation (Rogers and Bercovitz), 373
— Movements and Atropine (Klee), 373
— — and Ions (Brinkman and v. Dam), 632
— — and Nerves (Latarjet and others), 316
— — and Vagus (Bercovitz and Rogers), 260
— Pharmacology (Tezner and Turolt), 504
— Pylorus Movements (Wheelon and Thomas), 53
— Regurgitation into (Jarno and Vándorfy), 261
— Ruminant's (Censi Mancia), 373
— Secretion (Sutherland), 261; (Unna and Wissig), 504
— Structure (Miyagawa), 53
— Tube, Effect on B.P. (McKinlay), 133
Stomata and Citrus Canker (McLean), 231
— of Mosses (v. Wettstein), 644
— of Parasite Plants (Cammerloher), 158
Straw, Hydrolysed, for Food (Wagner and Schöler), 57
Streptococci, Growth of (Weichardt), 93
Subconjunctival Injections (Mukai), 592
Suberin and Cutin (Priestley), 286
Succinodehydrogenase (Ohlsson), 414; (Widmark), 478
Succus Entericus Lipase (Roger and Binet), 506
Suckers of Octopus (Parker), 299
Sucrase Action on Inulin (Colin), 97
Sucrose Estimation (Jackson and Gillis), 6; (Rose), 296; (Schneller), 338
— in Urine (Murschhauser), 442
— Inversion, Heat of (Dixon and Ball), 14
Sugar Acids, Rotations (Levene), 549
— Brown and White (Soar), 56
— by Micro-Bertrand (Ambard), 6
— Estimation (Jonescu and Vargolici), 170; (Guillaumin), 471; (Benedict and Osterberg), 549
— Estimations (Legrand), 535
— — Bang's Method (Holbøll), 170
— — by Dinitrosalicylic Acid (Sumner), 379
— Fermentation (Neuberg and others), 534
— Fungi (Kopeloff and others), 341
— in Urine, Estimation (Benedict), 6
— Intravenous Injection (Bürger and Hagemann), 50
— Iodometric Estimation (Baker and Hulton), 6; (Shaffer and Hartman), 6
— Metabolism (Staub), 377
Sugar of Lotus (Hemmi), 338
— of Secretions and Effusions (Hiruma), 515
— Test for (de Jager), 269
— — in Urine (Sumner), 170
— Tolerance (Maclean and Wesselow), 50
— — and Enzymes (Staub), 322
— Transformation by Liver (Isaac and Adler), 379
Sugars and Amino-Acids, Interaction (Grünhut), 473
— and Bacteria (Wolf), 648
— Chemistry (Kiliani), 238
— Estimation of Several (Fellenberg), 6
— Mixed, Estimation (Murschhauser), 350
— Plant (Vergelot), 647; (Arnold), 647
— Researches on (Pictet), 600
— S and Se Derivatives (Wrede), 8, 473; (Neuberg and Liebermann), 473
Sulphate and S Estimation by Benzidine (Fiske), 381
Sulphates in Blood, etc. (Heubner and Bisch), 496
Sulphocyanides, Function (Cavazzani), 405
Sulphur and Phosphate of Soils (Lipman and Joffe), 338
— Purgative Action of (Willigen), 152
Sun Energy (Reinan), 222
Supramaximal Contraction (Sherrington), 358
Suprarenal and Blood Sugar (Sakagachi and others), 515
— and Cramp (Fischer), 147
— and Diet (Kellaway), 57; (La Mer and Campbell), 61
— and Emotions (Kieley), 31
— and Heart Rate (Cannon and Rapport), 639
— and Intestine Contractions (Mira and Fontes), 272
— and Metabolism (Aub and others), 212; (Marine and Baumann), 447
— and Reflex Salivation (Gley and Quinquaud), 260
— and Splanchnic (Gley and Quinquaud), 520; (Tournade and Chabrol), 520
— and Thyroid (Herring), 70
— — Diseases (Friedman), 147
— — in Starvation (Vincent and Hollenberg), 212
— and X Rays (Grabfield and Squier), 147
— Cortex and Cholesterol (Chauffard and others), 267
— — and Pancreas (Tokumitsu), 71, 639
— Development (da Costa), 212
— Disturbance (Osborne), 582
— Effect of Adrenaline on (Hallion), 382
— Function (Löwenthal), 272
— Insufficiency (Lucibelli), 147; (Stewart), 327
— Post-Operative Exhaustion (Stewart and Rogoff), 273
— Veins (Maresch), 147
Surface Phenomena (Osborne), 172
— Tension and Viscosity (Traube), 403
— — Apparatus (Kopaczewski), 236
— — Method (Brinkman and v. Dam), 609
Swarm Cells Motility (Bolte), 231
Sweat Ducts (Parrisius), 210
— Glands, Innervation (Billigheimer), 210
— H-Ion Concentration (Talbert), 210
— Innervation (Pari), 26
— Insensible (Musumeci and Di Macco), 210
— Secretion (Pari), 325
Sweating and Hot Baths (Bazett and Haldane), 324
Swelling and Shrinkage (Richter-Quittner), 472
— of Fibrin (Somogyi), 406
Symbiosis and Food (Reinheimer), 469
— in Actinia (Fulton), 298
Symbiotic Fungus (Brues and Glaser), 411
Sympathetic and Cerebrum (Rogers), 183

Sympathetic and Hæmorrhage (McGuigan and Atkinson), 416
— and Iris Pigment (Waadenburg), 124
— and Parasympathetic (Pottenger), 271
— and Sensation (Tournay), 618
— and Tonus (Various authors), 618
— and Vagus on Heart (Cori), 568
— Sacral (Johnson), 121
— System in Children (Friedberg), 280
— Tone (Lehmann), 274
Synapis in Germ Cells (Hogben), 18
Syringe, Mechanical Aseptic (Gates), 109
Syringomyelocœle (Baldwin), 641

Tactile Corpuscles (Marinesco, Collin), 419
— Localisation (Stopford), 492
Tadpole Growth and Drugs (Macht and Bloom), 452
Tadpoles, Metamorphosis (Gayda), 578; (McCarrison), 579
Tannin Extraction (Knape), 286
— of Hokkaido (Balderston), 338
— Preparations (Sollmann), 152
Tannins of *Morus* (Ghirlanda), 95
Taste and Constitution (Furukawa), 250
— and Temperature (Komuro), 364
— Buds, Degeneration (Olmsted), 307
— — Development (Cook and Neal), 126
— Equations (v. Skramlik), 622
— Sweetness of Saccharin (Paul), 30
— Threshold for Homologues, etc. (Renqvist), 29
Taurin Reaction (Schmidt), 297
Tea Intoxication (Starr), 280
Teeth and Ca Metabolism (Rumsey), 66
— and Diet (Mellanby), 264
— and Vitamins (Howe), 578
Temperature and Air Currents (Lange), 321
— and Blood Changes (Barbour), 321
— and Protein Metabolism (Freund), 69
— Body, and Gum Injections (Barbour and Baretz), 89
— — in Exercise (Rancken), 68
— Coefficients (Krafka), 294; (Dhar), 295
— — of Medusæ (Schaefer), 241
— Conduction (Taylor), 205; (Zondek), 205
— Deep Body (Zondek), 68
— Effect on Cockchafers (Faes and Staehelin), 354
— — on Mosquitoes (Flu), 115
— etc., on Aquatic Life (Wundsch), 300
— of Animals (Benedict and others), 440
— of Cows (Kriss), 321
— of Rats (Bierens de Haan), 142
— Record (Woodhead and Varrier-Jones), 142
— Regulation and Hormones (Adler), 69
— — in Rabbits (Moore), 378
— Spread (Macleod), 378
Tendon, Properties of (Friedberg), 301
Terpenes, Reactions (Galavielle and others), 238
Testis after Vasectomy (Wheelon), 275; (Retterer and Voronoff), 384
— All or Nothing Effect (Pézard), 75, 76
— and Endocrines (Nakamura), 75
— and Inanition (Siperstein), 65
— and Pituitary (Hayami), 75
— and Secondary Characters (v. Keussler), 77
— and Sex Characters (Champy), 149
— and Thyroid Transplants (Voronoff), 382
— Extracts, Effects (Weil), 149
— Internal Secretion (Massaglia), 76
— Interstitial Cells (Courrier), 329; (Pérez), 329; (Benda), 329; (Humphrey), 384; (Aron), 384
— — Gland in Fish (Courrier), 640
— — Hyperplasia (Kuntz), 214
Testis Interstitial Tissue (Lipschütz and others), 275; (Levy-Lenz), 275
— Transplantation (Lichtenstern), 585
— — etc., (Mühsam), 276
Tetany and Blood Reaction (Greenwald), 453
— and Guanidine (Nattrass and Sharpe), 446; (Klinger), 447
— Ions in Blood (Tisdall and others), 456
Tetrahydropyrido-3-4-Iminazol (Dale and Dudley), 590
Tetramethyl Ammonium Chloride instead of Curare (Ackermann), 3
Thalamus and Blood-Pressure (Rogers), 25
Thermionic Valve Uses (Steinhausen), 108; (Philippson), 609
Thermotropism in Plants (Hagem), 232
Thiocyanic Acid in Plants (Dezani), 459
Thiosulphate in Plants (Hannevart), 459
Thioureas, etc., Toxicity (Hanzlik and Irvine), 526
Thirst Effects (Kudo), 321
Thrombin of Serum (Nolf), 367
Thrombozyme Preparation (Nolf), 254
Thymic (Thymosinic) Acid (Steudel and Peiser), 10
Thymol and Carvacrol Toxicity (Livingston), 387
Thymus after Serum Injection (Dustin), 382
— and Age (Gedda), 583
— and Male Organs (Leupold), 638
— and Reproductive Organs (Leupold), 70
— and Thyroid (Zunz), 71
— — Weight in Man (Scammon), 146
— Cells of (Dustin), 272
— Cortex Cells (Pinner), 212
— Extirpation (Tongu), 520
— Feeding (Romeis), 212
— Morphology (Hammar), 583
— Spleen and Marrow (Asher and Matsuno), 639
Thyro-Parathyroidectomy (Simpson), 211
Thyroid Accessory (Trautmann), 211
— Adenoma (Boothby), 147
— and Blood Picture (Baggio), 326
— and Brain (Ceni), 326
— and Ca Metabolism (Klein), 326; (Trendelenburg and Goebel), 326
— and Carbohydrate Metabolism (Asher and Harrisberger), 519
— and Carbohydrates (Sekita), 515
— and Cardiac Disease (Nice), 74
— and Cerebrum (Ceni), 272
— and Diet (Tsuji), 147
— and Glucose Mobilisation (Sanger), 146
— and Glycosuria (Friedman and Gottesman), 520
— and Growth (Cameron and Carmichael), 211
— and Heart (Hashimoto), 583
— — in Adiposity (Zondek), 74
— and Heat Regulation (Hildebrandt), 519
— and Immunity (Ecker and Goldblatt), 519; (Clevers), 519; (Houssay and Sordelli), 519, 520
— and Iodine Effects (Cameron and Carmichael), 69
— and Liver (Dragoiu and Fauré-Frémiet), 446
— and Metamorphosis (Jenson), 147
— and Parathyroid Feeding (Cameron and others), 638
— and Serum Concentration (Frowein), 519
— and Spleen (Baggio), 520
— and Suprarenal (Herring), 70
— — in Starvation (Vincent and Hollenberg), 212
— and Testis Transplants (Voronoff), 382
— and Thymus (Zunz), 71; (Asher and Nyffenegger), 520
— — Weight in Man (Scammon), 146
— and Thyroxin (Widmark), 271
— Cells, Flagellated (Cowdry), 638

Thyroid Colloids in Blood (Kottmann), 89
— Composition (Zunz), 325
— Diseases and Suprarenal (Friedman), 147
— Effect on Heart (Demoor), 382
— — on Invertebrates (Romeis and Dobkiewicz), 70
— Enlargement (Brooks), 271; (Schlesinger), 272; (Levin), 272
— — and Goitre (Durham), 146
— Feeding of Invertebrate (Kahn), 638
— Hyperplasia (Mellanby), 325
— in Protein Intoxication (Tatum and Sweet), 146
— Iodine (van Dyke), 382
— — Distribution (v. Dyke), 69, 271
— Lobes, Activity (Brown), 146
— Overaction (Kaminura), 519
— Parathyroid, and Metabolism (Labbé and Stévenin), 583
— Relations to Pituitary (Herring), 72
— Secretion in Blood (Rogoff and Goldblatt), 582
— Tadpole Feeding (Wegelin and Abelin), 326
— (Thyroxine), Effects of (Various authors), 446
Thyroidectomy (Hug), 638; (Underhill and Nellans), 638
— in Horses (Houssay and Hug), 146
Thyroxin Action (Plummer and others), 446
— and Growth (Cameron and Carmichael), 211, 326; (Plummer and Boothby), 211
Tides, Influence of (Flatteley), 469
Time Control Instruments (Laird), 170
Tissue Culture (Lynch), 356
— — and Amœba (Hogue), 616
— — Loss of Specific Characters (Champy), 116
— — Media (Ebeling), 356
— Cultures (Lewis and Webster, Ebeling, Carrel and Ebeling), 480, 481; (Various), 554
— — Effect of Galvanic Current (Ingvar), 116
— — — of $KMnO_4$ (Lewis), 19
— — of Insect (Collier), 300
— Extracts (Dold), 448
— — Clotting, and Histamine (Mills), 332
— — Effects (Backmann), 455
— Respiration (Lipschitz and Gottschalk), 589; (Lipschitz and Hertwig), 590
— — and Oxygen Pressure (Battelli and Stern), 48
— — and Vitamins (Abderhalden), 577
— — Heart Ganglion (Garrey), 615
— — Red Cells (Ellinger), 624
— — See also Oxygen Usage
— Tensions Plant (Schuepp), 164
Titanium in Plants (Geilmann), 599
T.N.T. Poisoning (Lewin), 333
Tobacco Effects (Mendenhall), 387; (Gies and others), 387
— Smoke as Bactericide (Puntoni), 524
— Smoking, Effect (Baumberger and others), 623
Tolerance to Morphine (Biberfeld), 588
Tomato Ripening (Edgerton), 342
Tone, Muscular, and Head Posture (Reys), 245
Tongue Papillæ Development (Hellman), 556
— — Rabbit (Krieg), 482
Tonsils and Metabolism (Farmachidis), 521
— Functions (Fleischmann), 448
Tonus and Tropisms (Rabaud), 552
— and Reflexes (Salomonson), 182
— in " Hypnosis " (Schaefer), 623
— Rhythm of Diaphragm (Nice and Neill), 181
Touch, Pressure, Threshold (Hanson), 307
— Sense of (Turró), 126
— Spatial Relations (Gellhorn), 419
— Sympathetic Sensations (Mittelmann), 126
Toxicity and Conductivity (Powers), 219
— and Dose (Drzewina and Bohn), 113, 333
Toxicity and Mode of Dosage (Kolmer), 591
Toxins, Action of Metals on (Erdstein and Fürth), 393
— Bacterial Endo- (Douglas), 460
Transfusion, Blood Cells after (Bulliard), 253; (Penfold), 253
Transpiration (Freeman), 100
Transplantation (Whitten), 93
— and Individuality (Loeb), 107
Transplanted Tissues (Loeb), 244
Treadmill (Langlois), 294
Tree Forms (Rubner), 167
— Growth (Douglass), 342
Trichlorethylene as Xylol Substitute (Saphier), 7
Triphosphonucleic Acid Individuality (Thannhauser and Sachs), 11
Triton Poison (Matsusaki and Kabeda), 643
Trophospongium (Penfield), 355
Tropisms in Plants (Oehlkers), 165; (Langer), 165, (Buch), 165; (Collander), 165
— Plant (Various), 541
Trypanosome and Goitre (Chatton and Courrier), 335
Trypanosomiasis Treatment (Marshall), 457
Trypsin Activity (Edie), 478
— (Anhydrase) (Frankel and Feldsberg), 409
— Effect of C_H (Ringer), 478
— in Fæces (Krieger), 54
Tryptophane and Melanoidin (Fürth and Lieben), 476
— Bacterial Breakdown (Sasaki and Otsuka), 645
— — Destruction (Raistrick and Clark), 287
— — Reaction (Mattick and Williams), 341
— Hydrolysis and Humin (Holm and Gortner), 11
— in Proteins (Thomas), 174
— of Foods (Fürth and Lieben), 507; (Ide), 507
— Stability (Onslow), 406
— Tripeptide (Fränkel and Nassau), 11
Tubercle Bacillus, Growth (Masucci), 98
— Calorimetry in (McCann and Barr), 68
Tumour Transplants (Strong and Little), 157
Turbidimetry and Nephelometry (Denis), 350
Tyramine in *Capsella* (Boruttau and Cappenberg), 337
Tyrosin, Haloid Derivatives (Zeynek), 297
Tyrosinase (Haehn), 409
Tyrosine, Bacterial Destruction (Raistrick and Clark), 287
— — Products from (Hirai), 226; (Otsuka), 226
— Colorimetric Estimation (Thomas), 351
— Purity of (Berthelot and Ossart), 351
Twins and Monsters (Newman), 299
— Siamese (Matsuyama), 450, 451

Ultra-filters, Method (Knaffl-Lens), 4
Ultraviolet and Cataract (Hoeve), 124
— Light and Rickets (Lasch), 579
— — Effects (Hess), 114
Uræmia Toxins (Foster), 90
Uranium and Potassium for Heart (Zwaardemaker), 312
Urates in Termites (Jucci), 615
Urea and other N in Urine (Philibert), 471
— and Uræmia (Leiter), 528
— as Diuretic (Strauss), 388
— CO from, by NaOBr (Hurtley), 240
— Concentration (Herman), 518
— — and Kidney Function (Weiss), 63
— Distribution (Gad Andresen), 496
— Estimation (Stehle), 381; (Funcke), 471
— Estimation (Terwen), 5; (Stehle), 381; (Funcke), 471; (Strohmann and Flintzer), 549
— Excretion, Mechanism (Oliver), 145

Urea Hypobromite Method (Ambard), 5
— in Blood and Tissue (Nonnenbruch), 311
— in Breath (Battez and Dubois), 49
— in Liver P.M. (Fosse and Rouchelman), 262
— of Blood and Tissues (Becher), 62
— of Urine and Blood (Addis and Drury), 62
— Toxicity (Hugounenq and Florence), 334
— Urease Synthesis (Barendrecht, Mattaar), 352
Urease (Rona and Györgi), 14; (Hahn), 226; (Wester), 226; (Lövgren), 409
— Action of Poisons (Rona and Petow), 14
— Effects in Blood (Carnot and others), 220
Ureter Contraction (Penfield), 380
— Obstruction (Wislocki and O'Conor), 209
Uric Acid Acidity (Biltz and Herrmann), 407
— — and CO Poisoning (Czoniczer), 39
— — and Thymus (Rother and Szegö), 520
— — and Liver (Chauffard and others), 157
— — Compound in Blood (Davis and Benedict), 188
— — Dissociation (Kanitz), 477
— — Endogenous (Kollmann), 613
— — Estimation (Jackson and Palmer), 109
— — — in Blood (Autenrieth and Quantmeyer), 425
— — Excretion and Drugs (Myers and Killian), 208
— — in Blood (Theis and Benedict), 496; (Biffi), 549
— — in Eclampsia, etc. (Williams), 282
— — of Blood (Rouzaud and Thiéry), 626
— — Pigmentation (Dozzi), 9
— — Salts (Curtman and Hart), 240
— — Test for in Urinary Deposit (Weiss), 5
Urinary Secretion and Osmosis (Wertheimer and Dubois), 323
Urine, Acetone in (Citron), 145; (Pittarelli), 146; (Koopman), 270; (Citron), 270; (Goeckel), 270
— Acid Excretion (Holló), 209
— after HCl Ingestion (Stehle and McCarty), 444
— after Swimming (Sata), 518
— Albumin and Sugar (Renaux), 381
— — Test (Rado), 445
— Amino Acids of (Blum), 67
— — N (Ciaccio), 471
— and Blood, Urea Content (Addis and Drury), 62
— Bile and Blood Removal (Burwell and Jones), 444
— Carbonates Test (Mitchell), 270
— Chylous (Sano), 209
— Citric Acid Estimation (Amberg and Mayer), 209; (McClure), 209
— Collection in Goat (Peters), 66
— Creatinine and Work (Schulz), 145
— — Estimation (Goeckel), 270
— Day and Night (Campbell and Webster), 637
— Enzymes (Hedin), 145
— Formaldehyde in (Pittarelli), 271
— Frog's (Heyde), 209, 321
— Glucose and Lactose in (Matthews), 6
— Hæmolysis by (Ponder), 63
— Hæmolytic Component (Ponder), 445
— Hippuric Acid (Violle), 145
— in Diuresis (Cori), 269
— Lactose in (Herzberg), 444
— N and Cl Excretion (Nelson and Kinney), 204
— Na, K, Ca, Mg Estimation (Tisdall and Kramer), 548
— Non-Dialysable Toxin (Pribram), 63
— Pentose in (Justin-Mueller), 324
— Pepsin in (Nomura), 381
— Phenols in (Weiss), 5
— Phenolsulphonephthalein Test (Pedersen), 64
— Phosphate Estimation (Fiske), 270
Urine Precipitins in (Grulee and Bonar), 518
— Protein Estimation (Bradley and Elliott), 209
— — Separation (Cavazzani), 209; (Hektoen), 209
— — Test (Hibma), 270
— Proteoses (Fittipaldi), 270
— Purine Bases (Steudel and Chou), 518
— Reaction (Hari), 324
— — after $NaHCO_3$ (Palmer and others), 63
— — and Blood (Bahlmann), 145
— Salts in Herbivora (Chaussin), 64
— Secretion, Ambard's Laws (Austin and others), 208
— — and Gum-Glucose Infusions (Mattill and others), 144
— — and Œdema (Ellinger), 62
— — in Frog (Atkinson and others), 444
— — Mechanism (Stieglitz), 207
— Silicic Acid Elimination (Zuckmayer), 209
— SO_4, and S (Rabaut and Stillmunkés), 471
— Stalagmone (Zandrén), 270
— Stalagmones (Schemensky), 63; (Pribram and Eigenberger), 209; (Bechhold and Reiner), 210
— Sugar and Polysaccharide (Benedict), 6
— — in (v. d. Harst and Koers), 471
— — Test (de Jager), 269
— Surface Tension (Joël), 445; (Duhot and Gernez), 445
— Urea, NH_3, and Amino-Acids (Philibert), 471
— Visco-Stalagmometry (Joël), 445
Urobilin (Bauman), 597
— Sources (Brulé), 445
Uroleptus, Cutting of (Calkins), 552
Uterus and Endocrines (Athias), 327
— Bile and Cathartics on (Okamoto), 384
— Effect of Drugs (Ogata), 592
— Exudate (Briggs), 586
— Involution (Loeb and Kuramitsu), 216
— Mucosa and Clotting (King), 586

Vacuoles and Granules of Cells (Prigosen), 356
Vagina, Innervation (Gunn and Davies), 215
Vagotomy in Guinea-Pig (Giusti and Houssay), 315
Vagus and Adrenaline (Amsler), 147
— and Atropine (Garrelon and others), 628
— and Heart (Cori), 568
— and Lung (Patterson), 630; (Larsell and Mason), 630
— Effect of Section (Litthauer), 137
— Effects on Heart (Haberlandt), 313
— Excitation and K (Bouckaert), 559
— Pulmonary, and CO_2 (Suñer and Bellido), 359
— Sparteine on (Chistoni), 525
Valerates, Metabolism (Blum and Aubel), 439
Variegation in Leaves (Winge), 166
— in Plants (Balasubramanyam), 102
Vas Deferens Secretion (Benoit), 328
Vascular Reflexes (Ebbecke), 559
Vasectomy and Endocrines (Nakamura), 75
Vasodilatation by Acids, etc. (Heymann, Fleisch), 430
Vasomotion and High Frequency Treatment (Kowallek), 134
— in New-Born (Albertoni), 133
Vasomotor Centre Automaticity (Foa), 134
— Fibres of Lung (Luckhardt and Carlson), 260
— Reflex, " White Adrenal Line " (Kay and Brock), 273
— Reflexes (Carlson and Luckhardt), 122
— Response to Medulla Anæmia (Winkin), 273
Vasotomy (London and Kotschnew), 3
Vaucheria Oil Drops (Mangenot), 228
Veins, Innervation of (Donegan), 429

Venipuncture in New-Born (Gordon), 629
Venom, Bee (Lissy), 333
— Cobra (Monserrat and others), 220
— Snake (Gunn and Heathcote), 87; (Houssay and Sordelli), 87
Venous Pulse, Systolic Wave (Gerhartz), 570
Ventilation and Infection (Douglas and Hill), 157
Ventricle, Extra Systoles and Fibrillation (de Boer), 191, 192
— Fibrillation and Camphor (Frohlich and Grossmann), 312
— Systole and Diastole (Wiggers), 426
Ventricular Fibrillation (Kisch), 498
— Systole Duration (Katz), 256
Veratrine and Local Anæsthetics (Schüller and Athmer), 588
Veronal and Permeability of Skin (Jacobj), 82
Vestibular Nerve (Sachs and Alvis), 619
— Reactions (Rothfeld), 620
— — and Cerebrum (Rothfeld), 184
Vestibule: See Labyrinth
Vinegar Eel, Vitality of (Passerini), 402
Visceral Reflexes (Carlson and Luckhardt), 248
— Sensory System (Carlson and Luckhardt), 122
Viscosity of Red Corpuscles (Hatschek), 33
— of Suspensions (Hess), 110
Viscostalagmometer (Traube), 403
Vision, " All or None " Law (Troland), 306
— and Electrons (Poole), 551
— and Erect Posture (Collins), 621
— and Fluorescence (Schanz), 561
— Attention in (Roelofs), 250
— Dark Adaptation (Hecht), 621
— Energy Involved (Noüy), 419
— Foveal (Swindle), 620; (Hecht), 621
— in Fish (Scheuring), 306
— Inhibition of Peripheral (Dunlap), 184
— Instrument (Ruso), 349
— Latency in (Piéron), 306
— Momentary (Ebbecke), 124
— of Birds (Honigmann), 363
— Photochemical Theory (Koeppe), 250
Visual Acuity (Ferree and others), 30
— — Apparatus (Kirsch), 4
— Cells, Amblystoma (Detwiler and Laurens), 621
— Constants (Fischer), 365
— Habits in Birds (Schut), 252
— Line Apparatus (Tschermak), 236
— Purple, Photochemistry (Hecht), 27
Vital Staining (Potts), 242
Vitalism and Adaptation (Roux), 3
Vitamin A (Zilva and others), 59; (Steenbock and others), 201; (Wason), 201; (Zilva and Drummond), 508
— — Lack of, on Kittens (Mackay), 264; (Tozer), 264
— Ag Compound of (Seidell), 202
— and Secretin (Cowgill), 264
— and Xerophthalmia (Bloch), 60
— and Yeasts (Euler and Petterson), 536; (Tholin), 536
— Antiscorbutic (Ellis and others), 264; (Hart and others), 264
— — Destruction of (La Mer and others), 140
— — of Citrus Juice (Davey), 265
— — of Condensed Milk (Hume), 265
— — of Dried Milk (Jephcott and Bacharach), 265
— — of Fruits (Givens and others), 265
— — Oxidation (La Mer), 634
— — — of (Hess and Unger), 265
— B and Appetite (Wright), 634
— — and Secretin (Anrep and Drummond), 202
Vitamin B of Yeast (Nelson and others), 289; (Williams), 289; (Harden and Zilva), 460
— Destroyed by Oxidation (Hopkins), 60; (Drummond and Coward), 60; (Zilva), 60
— Fat Soluble (Sherman and others), 140
— Growth of Yeast (Funk and Dubin), 59
— Measurement (Eddy and Stevenson), 59
— of Lard (Drummond and others), 60
— Oxidation of (Zilva), 140
— Yeast Test (Eddy and others), 263
Vitamins (England), 263; (Sherman and others), 263; (Portier and others), 435-7
— and " Bios " (Ide), 376; (Biourge), 376
— and Carotene (Stephenson), 60
— and Carotinoids (Palmer and Kennedy), 319
— and Cell Respiration (György), 319
— and Colloids (MacDougal), 604
— and Common Sense (Halliburton), 139
— and Cooking (Delf), 203
— and Enzymes (Thiébaut), 59
— and Foods (Harden), 507; (Bottazzi), 508
— and Foodstuff Rations (Desgrez and Bierry), 263
— and Glands (Cowgill and Mendel), 634
— and Metabolism (Abderhalden), 633
— and Nutrition (Leeuwen, Dutcher, Cowgill, Abderhalden, Howe, Smith, Anderson and others), 577-8
— and Organ Changes (La Mer and Campbell), 61
— and Oxygen Usage (Abderhalden and others), 140
— and Pigments (Steenbock and others), 375
— and Poisons (Leeuwen and Verzár), 634
— and Polyneuritis (Walshe), 634
— and Teeth (Mellanby), 264
— and Thyroid (Tsuji), 147
— and X Rays (Cramer and others), 265
— and Yeast Growth (Williams), 202; (Damianovich and Catan), 202
— Aspects of (Hess), 107; (Halliburton), 107
— Bacterial (M'Leod and Wyon), 230
— Effect of Heat (Nobel), 511
— Fat Soluble (Various), 633
— for Guinea-Pigs (Tozer), 275
— for Rabbits (Lopez-Lomba and Portier), 375
— General Account (Dalyell), 139
— History and Theories (Häussler), 139
— in Food and Milk (Hughes and others), 202
— in Vegetables (Shorten), 319; (Shorten and Ray), 320
— of Coffee (di Mattei), 140
— of Honey (Hawk and others), 59, 202
— of Milk (Hopkins), 60; (Stepp, Rosenau), 386
— of Urine (Curatolo), 59
— of Yeast (Penau and Simmonet), 375; (Renshaw), 507
— — Bread (Hawk and others), 140
— Plant (Delf), 263
— Plants and Bacteria (Lecoq), 58
— Preserved Food (Bidault), 263
— Properties (Bürgi), 375; (Euler and Myrbäck), 375
— Requirements for Rats (Funk and Dubin), 59
— Review (Sherman), 633
— Synthesis of B by Yeast (Nelson and others), 202
— Various (Various authors), 508-11
— Yeast (Abderhalden), 263
Vividiffusion Technique (v. d. Heyde and Morgantown), 402
Voice of Children (Fröschels), 2
Volatile Substances (Dixon and Ransom), 217
Voluntary Reactions (Grübaum), 365
Volvocaceæ of Madras (Parthasarathy), 99
Vorticella Reactions (Danisch), 479

Vowel Sounds, Nature (Scripture), 2
Vuzine and Eukupine (Bylsma), 81

Walking, Physiological Cost (Waller and de Decker), 204
Wandering Cells, Origin (Hannemann), 20
Wassermann Reaction (Forssmann), 529; (Müller), 529
— — Modified (Dreyer and Ward), 284
Water and Salts in Plants (Shrive), 540
— and Seeds (Bouyoucos and McCool), 540
— Content of Body (Adolph), 141, 320; (Bogendörfer), 320
— Culture (Meier and Halstead), 537
— Exchange and Salts (Lasch), 280
— — in Frog (Parnas), 210
— Exchanges (Meyer-Bisch), 567
— — of Tissues (Ellinger and Heymann), 483
— Intake of Plants (Montfort), 231
— Regulation (Ide), 512
— Relations of Plants (Aitken, Gore and Mangels), 604
— Transport by Plants (Szolnoki), 164
Weight of Organs (Stewart), 635
Wheat Rust (Pipal), 104
White Adrenal Line (Kay and Brock), 273
Wind, Action on Plants (Bernbeck), 167
— and Plant Growth (Hill), 102; (Bernbeck), 233
Wing Colour in *Lepidoptera* (Onslow), 15
Wood Analyses (Dore), 94
— Colloids (Wislicenus), 95
— Crystals in (Baker), 644
— Preservation (Moll), 162
Wool Fat (Lifschütz), 475
— — Absorption of Water (Lifschütz), 238
Word Blindness (Mayendorf), 305
— — Congenital (Fildes), 622
Work and Output (Ryan and Florence), 169
— and Rest (Wallrich and Dawson), 401
— Cost of (Waller and De Decker), 511
Worm, Function of Hb in (Jordan and Schwarz), 108
Wormwood Oil (Rabak), 600
Wound Cicatrisation (Carrel and du Noüy), 482; (Carrel), 597
— Healing (Foot), 617
— Infections (Douglas and others), 93
Wounds, Evolutionary (Keith), 401

Xanthoxylum Bark (Goodson), 286
Xerophthalmia. See Ophthalmia
X Ray, Biological Effects (Holthusen), 114
— Stimulation (Petersen and Saelhof), 217
X Rays and Blood Coagulation (Feissly), 567
— and Vitamins (Cramer and others), 265
— on *Drosophila* (Mavor), 176
— on Plants (Petry), 542
— on Tadpoles (Hartmann), 309
Xylol Substitute (Saphier), 7
Xylose Utilisation (Rockwood and Khorozian), 318

Yawning, Causes, etc. (Mayer), 260
Yeast, Acclimatisation to As (Effront), 161
— Ag Salts on (Zerner and Hamburger), 648
— and Methlylene Blue (Kumagawa), 646
— as Bacterial Food (Jötten), 601
— Autolysis (Iwanoff), 533
— Biology of (Bokorny), 225
— " Bios " (Biourge), 648
Yeast Colloidal Proteins (Fodor), 95
— Copper in (Wirthle and Amberger), 599
— Fats (Maclean), 338
— Fermentation and Acids (Somogyi), 534
— — and Nonylic Alcohol (Windisch and others), 225
— Galactose (Euler and Laurin), 459
— — Adaptation (Euler and others), 227
— Growth (Lindner) 229
— in Pure Nutrients (MacDonald), 163
— Invertase (Lövgren), 96
— Nitrogen (Meisenheimer), 338
— Nucleic Acids (Steudel and Peiser), 338
— Peptases (Abderhalden and Fodor), 96
— Physiology (Köhler), 98
— Protein Cleavage (Iwanoff), 533-4
— Proteins (Thomas), 532
— Species (de Mello), 536
— Sugar Assimilation (Klöcker), 163
— Temperature and Settling (Will), 225
— Toluene Action on (Giaja and Djermanovitch), 225
— Value in Bread (Hawk and others), 263
— Vitamin Test (Eddy and others), 263
— Vitamins (Williams), 289; (Nelson and others), 289
— Zigzag Phenomenon (Köhler), 96; (Schulz), 81
Yeasts from Nectar (Schoelhorn), 225

Zinc in Foods (Bodansky), 548
— in Tissues (Bertrand and Vladesco), 235, 349
Zymase (Giaja), 95
Zymin Fermentation (Harden and Henley), 287

Book Reviews.

Autonomic Nervous System (Langley), 650
Basal Metabolism (Boothby and Sandiford), 104
Biochemistry (Moore), 399; (Brailsford Robertson), 399
Biological Chemistry (Roaf), 466
Biologischen Arbeitsmethoden (Abderhalden), 545
Biophysics (Burn), 545
Blood Analysis (Myers), 106
Blood, Chemical Analysis (Myers), 168
Botany: Anatomy and Physiology (Wiesner), 106
Capillary Tube Technique (Wright and Colebrook), 545
Central Nervous System (Clarke and Henderson), 105
Chemical Physiology (Schmitz), 106
Chemistry, Annual Report of Progress, 105
Colloidal Solutions (Burton), 466
Colloids in Living Matter (Lumière), 399
Deficiency Disease (McCarrison), 292
Der Mensch als Kraftmaschine (Oppenheimer), 233
Dictionary of Botanical Equivalents (Artschwager and Smiley), 347
Embryology of Vertebrates (Brachet), 608
Enzyme, Chemistry (Euler), 399
Ergebnisse der Physiologie, Vol. 18, 106
Ergebnisse der Physiologie, Vol. 19, 466
Experimental Physiology (Burton Opitz), 104
Experimental Rickets (Mellanby), 545
Experimentelle Phonetik (Panconcelli-Calzia), 233
Extra Pharmacopœia (Martindale and Westcott), 233
Food Analyses and Energy Values (Plimmer), 399
General Physiology (Bayliss), 168
General Physiology Principles (Bayliss), 106

Japan Medical World, 400
Microscopy Précis (Langeron), 400
Microtomist's Vade-Mecum (Lee), 399
Nervous System (Ranson), 106, 168
Œdema and Nephritis (Fisher), 467
Philippine Mountains, Vegetation (Brown), 106
Physical Chemistry (Michaelis), 292
Physiological Chemistry (Milroy), 544
Physiological Reviews (Amer. Physiol. Soc.). 105
Physiology, Manual of (Lyle and de Souza), 607
Practical Physiology Course (Paton and others), 292
Proc. Soc. Exp. Biol. and Med., Meltzer Number, 466
Protein Metabolism (Cathcart), 105
Respiratory Metabolism Tables (Carpenter), 465
Scurvy (Hess), 106
Soaps and Proteins (Fisher), 467
Theorie Ionique de l'Excitation (Lasareff), 346
Veterinary Physiology (Smith), 465

H K LEWIS & CO. LTD. 28, GOWER PLACE, LONDON, W.C. 1

Vol. VI. No. 12. March, 1922.

PHYSIOLOGICAL ABSTRACTS

UNIVERSITY OF ILLINOIS LIBRARY
APR 25 1922

ISSUED BY

THE PHYSIOLOGICAL SOCIETY
(GREAT BRITAIN AND IRELAND)

WITH THE CO-OPERATION OF

THE AMERICAN PHYSIOLOGICAL SOCIETY

AND ALSO OF

THE AMERICAN CHEMICAL SOCIETY
THE AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY
THE AMERICAN PHARMACOLOGICAL SOCIETY
THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS
BIOLOGISK SELSKAB OF COPENHAGEN
THE CARNEGIE INSTITUTION OF WASHINGTON
THE CHEMICAL SOCIETY (GREAT BRITAIN AND IRELAND)
THE BIOCHEMICAL SOCIETY (GREAT BRITAIN AND IRELAND
ARCHIVES INTERNATIONALES DE PHYSIOLOGIE (PROF. LÉON FREDERICQ)
SOCIÉTÉ BELGE DE BIOLOGIE (PROF. E. ZUNZ)
THE RUSSIAN BIOLOGICAL SOCIETY
ARCHIVIO DI FISIOLOGIA (PROF. FANO)
ARCHIVES ITALIENNES DE BIOLOGIE (PROF. ADUCCO)
ARCHIVES NÉERLANDAISES DE PHYSIOLOGIE (J. P. LOTSY)
JOURNAL DE PHYSIOLOGIE (PROFS. E. GLEY AND CH. RICHET)
ACTA SCHOLÆ MEDICINALIS, KYOTO

PROF. ARTHUS (SWITZERLAND) PROF. A. KROGH (DENMARK)
PROF. BABKIN (RUSSIA) PROF. OVERTON (SWEDEN)
PROF. H. J. HAMBURGER (HOLLAND) PROF. ZWAARDEMAKER (HOLLAND)
PROF. ISHIKAWA (JAPAN)

EDITED BY W. D. HALLIBURTON
Professor of Physiology, King's College, London

ASSISTANT EDITOR, C. LOVATT EVANS
ASSISTANT EDITOR (FOR PLANT PHYSIOLOGY), WALTER STILES

H. K. LEWIS & CO. LTD., 136 GOWER STREET, LONDON, W.C. 1
PUBLISHING OFFICE, 28 GOWER PLACE, W.C. 1.

Monthly, Five Shillings net; Annual Subscription (April to March) 40s. net post free.

☛ Attention is specially directed to the Editorial Note this month.

THE JOURNAL OF GENERAL PHYSIOLOGY

EDITED BY

JACQUES LOEB, New York, N.Y. W. J. V. OSTERHOUT, Cambridge, Mass.

CONTENTS OF VOLUME IV, No. 3, JANUARY 20, 1922

NORTHROP, JOHN H. The inactivation of trypsin. I.

NORTHROP, JOHN H. The inactivation of trypsin. II. The equilibrium between trypsin and the inhibiting substance formed by its action on proteins.

NORTHROP, JOHN H. The inactivation of trypsin. III. Spontaneous inactivation.

OSTERHOUT, W. J. V. Direct and indirect determinations of permeability.

HARVEY, E. NEWTON. Studies on bioluminescence. XIV. The specificity of luciferin and luciferase.

REDFIELD, ALFRED C., AND BRIGHT, ELIZABETH M. The effects of radium rays on metabolism and growth in seeds.

CROZIER, W. J. Correspondence of skin pigments in related species of nudibranchs.

POWERS, EDWIN B. The physiology of the respiration of fishes in relation to the hydrogen ion concentration of the medium.

UHLENHUTH, EDUARD. The effect of iodine and iodothyrin on the larvæ of salamanders. IV. The rôle of iodine in the inhibition of the metamorphosis of thymus-fed salamanders.

UHLENHUTH, EDUARD. The influence of feeding the anterior lobe of the hypophysis on the size of *Ambystoma tigrinum*.

FENN, WALLACE O. The temperature coefficient of phagocytosis.

BROOKS, MATILDA MOLDENHAUER. The penetration of cations into living cells.

LOEB, JACQUES. The origin of the electrical charges of colloidal particles and of living tissues.

ANNUAL SUBSCRIPTION (one volume), $5.00

Published bimonthly by The ROCKEFELLER INSTITUTE for MEDICAL RESEARCH

Avenue A and 66th Street, NEW YORK

IMPORTANT NEW BOOKS

ŒDEMA AND NEPHRITIS

A critical, experimental and clinical study of the physiology and pathology of water absorption in the living organism.

By MARTIN H. FISCHER.

What the Reviewers say about it:

"The volume makes stimulating and even provocative reading; it may be warmly recommended to all physiologists and medical men who are interested in the main subjects with which it deals—namely, œdema, nephritis, and glaucoma."—*The Lancet.*

"This book deserves to be studied by every investigator of problems involving the biological relationships of water, for it presents effectively, and in a stimulating and interesting manner, from many points of view, the gist of our knowledge, theories, doubts and errors on this important general subject."—*Biochemical Bulletin.*

992 *pages.* 21 *Illustrations.* **Price 55/- *net.***

A MANUAL OF SELECTED BIOCHEMICAL METHODS

As applied to Urine, Blood and Gastric Analysis.

By FRANK P. UNDERHILL, Ph.D.

The methods detailed in this Manual represent the most accurate and reliable procedures that have been formulated in recent years. Moreover, where desirable, several methods for the same determination have been given, so that a choice may be made by the laboratory worker in order that his individual needs may be met. The book will meet not only the needs of medical schools desiring a fundamental course in biochemical methods, but will also be useful for physicians, research and commercial laboratories and hospitals.

232 *pages.* 12 *Figures.* **Price 17/6 *net.***

Please send for detailed Prospectuses "P.A."

CHAPMAN & HALL LTD.

11, HENRIETTA STREET, LONDON, W.C. 2

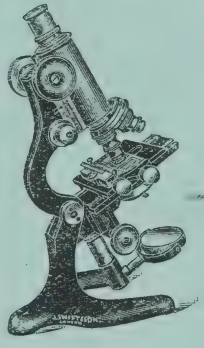
BAIRD & TATLOCK (LONDON) LTD

STANDARD
CATALOGUE
of
Physiological Apparatus

500 pages

Just Published

14-15 CROSS STREET HATTON GARDEN LONDON E.C.1



JAMES SWIFT & SON LTD.

Makers of the highest grade Microscopes and Accessories

Contractors to all Scientific Departments of H.M. Government.

NEW MODEL **"RESEARCH" MICROSCOPE**

For Physiological, Pathological, and Bacteriological Work.

For specifications and prices see list of new models, post free.

UNIVERSITY OPTICAL WORKS,
81 TOTTENHAM COURT ROAD, LONDON, W.1

Rates for Advertisements in this Journal.

	One Insertion.	Six (each)	Twelve (each)	
	£ s. d.	£ s. d.	£ s. d.	
PAGE	4 10 0	4 5 0	4 0 0	All Net.
HALF-PAGE	2 10 0	2 5 0	2 2 6	
QUARTER-PAGE	1 7 6	1 5 0	1 2 6	
ONE EIGHTH-PAGE	16 0	14 6	12 6	

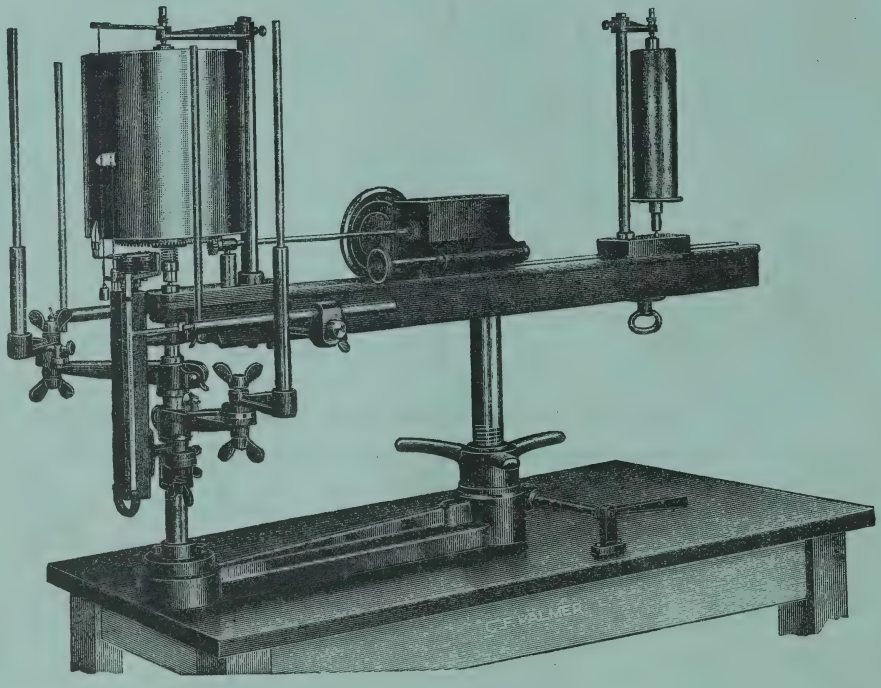
All applications for space to be made to

Mr. H. A. COLLINS, 32, BIRDHURST ROAD, CROYDON.

C. F. PALMER

MAKER OF PHYSIOLOGICAL AND OTHER RECORDING INSTRUMENTS

New Apparatus for Experimental Work a Speciality.



THE BRODIE-STARLING three-speed KYMOGRAPH, complete with Time-marker, Signal, Mercury Manometer, and separate Smoking Apparatus with Improved Gas Burner for smoking. Price £110.

C. F. PALMER

403, BRIXTON ROAD, LONDON, S.W. 9

Telephone: Brixton 2848.

Telegrams: "Myographic, Brix., London." *Cablegrams:* "Myographic, London."

UNIVERSITY OF ILLINOIS-URBANA
3 0112 099863109